# DOCUMENT RESUME

ED 131 949 PS 008 985

| | |
|---|---|
| TITLE | Southern University Research Center for Head Start Annual Report, November 27, 1970. Final Report. |
| INSTITUTION | Southern Univ. and Agricultural and Mechanical Coll., Baton Rouge, La. |
| SPONS AGENCY | Office of Economic Opportunity, Washington, D.C. |
| PUB DATE | 27 Nov 70 |
| CONTRACT | OEO-8-4123 |
| NOTE | 257p.; For 1969 Annual Report, see PS 008 986 |
| EDRS PRICE | MF-$0.83 HC-$14.05 Plus Postage. |
| DESCRIPTORS | Achievement Tests; Annual Reports; Behavior Change; Disadvantaged Youth; *Early Childhood Education; *Evaluation Methods; Intelligence Tests; *Intervention; Interviews; Language Development; Motivation; Parent Participation; Preschool Children; *Preschool Programs; Program Descriptions; *Program Evaluation; Psychomotor Skills; Rating Scales; Reinforcement; Tables (Data) |
| IDENTIFIERS | Luck; *Project Head Start; Southern University Research Center for Head Start |

ABSTRACT

This is the final report of the Southern University Head Start Evaluation and Research Center. It is a statement of activities engaged in since September, 1969. Chapter I contains an introduction and a description of the centers. Chapter II presents evaluation guidelines, quality control information, evaluation design and description of evaluation instruments. Chapter III contains the intervention design. Chapter IV presents statistical analysis information and findings. Appendices (which comprise the bulk of the report) include analysis of variance charts, means and t-tests for the intervention, and study entitled "Instrumental Performance as a Function of Reinforcement Schedule, Luck Versus Skill Instructions, and Sex of Child." (MS)

***********************************************************************
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
***********************************************************************

ED131949

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

11'76

# ANNUAL REPORT

November 27, 1970

# Research Center for Head Start

Southern University

Baton Rouge, Louisiana

Edward E. Johnson, Director

PS008985

This Research Center was supported by Subcontract # OEO 8-4123

## TABLE OF CONTENTS

Page

ACKNOWLEDGMENTS . . . . . . . . . . . . . . . . . . . . . . . . ii

STAFF . . . . . . . . . . . . . . . . . . . . . . . . . . . . iii

CENTER PERSONNEL . . . . . . . . . . . . . . . . . . . . . . . . iv

RESEARCH ASSISTANTS . . . . . . . . . . . . . . . . . . . . . . v

CHAPTER I . . . . . . . . . . . . . . . . . . . . . . . . . . 1

Introduction
Description of Centers

CHAPTER II . . . . . . . . . . . . . . . . . . . . . . . . . . 6

Evaluation Guidelines
Quality Control
Evaluation Design
Description of Evaluation Instruments

CHAPTER III . . . . . . . . . . . . . . . . . . . . . . . . . 15

Intervention Design

CHAPTER IV . . . . . . . . . . . . . . . . . . . . . . . . . . 24

Statistical Analysis
Findings

APPENDIX I

Analysis of Variance Charts
Tables 1 -49

APPENDIX II

Means and t-tests for the Intervention
Tables 1-49

APPENDIX III

Abstract

# ACKNOWLEDGMENTS

The contributions of the administration, faculty and staff of Southern University to the operation of this center are gratefully acknowledged. Special appreciation is due to two former members of the staff of this center, Mrs. Lucie Johnson and Mrs. Johnnie Ricard, for the initial writing of this report.

Special thanks are due to the administrators and staff of Community Advancement, Inc. Without their cooperation and support, the investigations reported here could not have been carried out.

## STAFF

E. E. Johnson, Director
Betty J. Franklin, Coordinator
Lottie Robinson, Secretary

## RESEARCH ASSISTANTS

(Duties included Interviewing, Testing, Observing Coding, Teaching)

Helen Burton
Margie Jackson
Georgiana Johnson
Willie E. Johnson
Lillie Louis
Alice Singh
Amelia Wilkerson
Velma Wilkerson

## STATISTICAL CONSULTANTS

Raymond Christopher
B. R. Farthing
Prentiss Schilling

## CLERICAL ASSISTANTS

Joyce Gordon
Linda Whitfield

## KEY PUNCH OPERATOR

Alice Singh

# CENTER PERSONNEL

## Project Directors

1. Dr. Edward E. Johnson, Director of the Southern University Head Start Evaluation and Research Center, is Associate Dean of the University and he is an experimental psychologist whose research interests and background vary from human engineering problems of hand grenade and tank design to the study of socially and economically disadvantaged children. Currently he functions as a consultant in the National Collaborative Child Development Program of the United States Office of Health, Education and Welfare and is Clinical Professor in the Department of Psychiatry and Biobehavioral Sciences of the Louisiana State University Medical School.

2. Betty J. Franklin, B. S. Business Education, Southern University. Payroll Accountant, Mississippi Valley State College, Business Education Teacher, Central Memorial High School, Coordinator, Head Start E & R Center, Miss Franklin currently is working toward the masters degree in Administration & Supervision.

## RESEARCH ASSISTANTS*

1. Mrs. Helen Powell Burton holds a Bachelor of Arts degree in Elementary Education from Southern University.
2. Miss Margie Jackson holds a Bachelor of Science degree in Secondary Education from Southern University.
3. Mrs. Georgiana A. Johnson holds a Bachelor of Arts degree in Elementary Education from Southern University.
4. Mrs. Willie Coleman Johnson received her Bachelor of Arts degree in Psychology from Southern University.
5. Mrs. Lillie Thornton Louis received her Bachelor of Arts degree in Elementary Education from Southern University.
6. Mrs. Alice Singh received her Bachelor of Arts degree in Philosophy from the University of Pittsburgh.
7. Miss Amelia Wilkerson holds a Bachelor of Arts degree in Elementary Education from Southern University.
8. Miss Velma Wilkerson holds a Bachelor of Science degree in Business Education from Southern University.

---

*All research assistants received specialized training in the methods and techniques of the experimental University of Hawaii Preschool Language Curriculum. They were also trained intensively in test administration by experienced examiners.

# CHAPTER I

# INTRODUCTION

This is the final report of the Southern University Head Start Evaluation and Research Center. It is a statement of activities engaged in since September, 1969.

Prior to September, 1969, Southern University and Tulane University were operating, technically, under the same contract even though their evaluation and research efforts were independent. During the past year, Southern University was totally independent. This report will contain the evaluation and research efforts of the Southern University Evaluation and Research Center.

The evlauation-related intervention study to be referred to herein, namely, the University of Hawaii Preschool Language Curriculum (UHPLC), is the same one used by our center last year when the actual collaboration in the evaluation intervention took place between Southern University and the University of Hawaii. To a great extent, what happened in this evaluation is similar to that of last year.

It is our opinion that the 1969-70 evaluation has been adequate, and real strides forward have been made in the area of research. Even more important than the advances in research may be the advances of each child involved in the intervention program--the significance of which might mean his happiness or unhappiness in later years. This document contains a presentation of activities engaged in by this center during the period referred to above and a detailed depiction and analysis of data obtained therein.

## DESCRIPTION OF THE CENTERS

Southern University Head Start Evaluation and Research Center is affiliated with four head start centers. These centers are Bertel T. Winder (formerly known as Harding), Community Association for the Welfare of School Children (CAWSC), Ryan and South Baton Rouge.

The building housing Bertel T. Winder Head Start Center is relatively new, containing central heat and air conditioning. It was previously a funeral home but was renovated for head start purposes. It is located in North Baton Rouge in an area known as Scotlandville.

The area on the right side and to the back of the center is fenced in. The fenced area serves the purpose of a playground except in inclimate weather when the children play on a covered patio-like structure which extends from the building onto the play area. The play area itself is paved for the most part. The two hundred children at the center share the playground equipment which consists of a sliding board, two see-saw sets, two swing sets, and two monkey bars. There are approximately twenty pieces of outdoor toys used by the children. Except for four tricycles which are new, these toys are weather beaten and well used-needing paint and repair. Beyond the play area is an auto salvage shop which is fenced in and is not accessible to the children.

There is ample parking space for vehicles on the left side of the center. As this area is off-limits to the children, there is little or no fear of a child-auto accident. Adjourning this area, separated by a fence, is a farm which is cultivated and harvested by prisoners from the parish jail.

The interior of the building consists of seventeen rooms and two rest rooms. There is one kitchen, five offices, one conference room (used jointly as a lounge and as a meeting room), and ten classrooms.

CAWSC Head Start Center is located in urban Baton Rouge in an area locally known as Eden Park. The neighborhood is very rundown and unkempt. The streets are littered with paper, beer cans, wine bottles, and soda pop bottles. There are many wrecked and/or unused cars that should be towed away. Many of the buildings are in very bad shape and should be demolished.

The deterioration of this neighborhood can also be attributed to the many night clubs and cafes found here. CAWSC is surrounded by these establishments. At night the center's parking lot is utilized by the patrons of these places.

CAWSC is housed in the rear of a stone building and has an enrollment of approximately sixty children. There is adequate parking space for faculty and staff members, but in rainy weather, the parking area is inconvenient since only half of it is paved.

The play area, which is fenced in and half paved, is adequate for the number of children there. There is a paved and covered patio where the children play during bad weather. The sand table, cots, wooden toys, wagons and tricycles are kept here. There are ample toys for the children to play with but they are all second-hand and well-used. On the playground there is one gym set, eight swings, one sliding board, one monkey bar set and one climbing turtle.

The interior of the building consists of four classrooms, five offices, one kitchen, and four baths. The walls of some rooms are paneled while others are semi-paneled.

Located at 501 Ryan Field about one-fourth mile from Ryan Airport is the Ryan Head Start Center. The center is approximately seven miles from the city of Baton Rouge and one and one-half miles from Southern University. Ryan's airport is situated one-fourth mile from the front entrance to the building.

The wood frame structure which is rather old and dilapidated was once used by the Army Reserve. Because of the age of the building, no attempts have been made at improving or modernizing the heating and lighting systems or at renovating it. These conditions have made it very difficult to achieve optimum performance in research and testing of children at the center. However, the general environment is conducive to learning.

The area surrounding the building is very good for nature walks, sightseeing tours and trips to the airport. There is a fenced in outdoor area which is used as a playground. There are several large oak trees in this area as well as one sliding board, one merry-go-round, and a swing unit with four individual swings.

There are eight classes in Ryan Head Start with an enrollment of approximately 150 children. Four of the classes were used in the intervention study.

Individual office space is provided for the head teacher, the secretary, the staff nurse, the social service staff, and the parental involvement coordinator. The rest room facilities are adequate. Although a kitchen is within the center, the food is transported daily from Bertel T. Winder center, one and one-fourth mile away, to Ryan. The center in total occupies 9,784 sq. ft. of floor space.

Another center used by the Southern University Head Start Evaluation and Research Center was the South Baton Rouge Head Start Center. This center is located at the corner of Texas and East Washington Streets in South Baton Rouge. It is approximately fourteen blocks from Louisiana State University and one block from the local Y.M.C.A.

The community surrounding the center is one that is intermingled with shabby houses, churches and sub-standard stores. There is also a locally owned service station and washerteria that is visibly unkept and in need of repairs. The parking lot of an abandoned supermarket serves as the center's only off-street

The building once was used as a boarding house, night club, grocery store, and barber shop. It is an old brick structure built around the 1930's. It is centrally heated and centrally cooled which creates comfortable temperatures year round. The center is unaccessible from the front. There are two side doors and two back doors to the center which also serves as exits to the play areas. The downstairs area of the center is used for four classrooms, two bathrooms, a hallway, and one utility room. Housed on the second floor are Neighborhood Service Center offices, one conference room, one bathroom, and the nurse's station used by head start.

The large playground is enclosed by a very high fence. The play equipment consist of a monkey bar, a swing set, bicycles, balls and a sandbox.

# CHAPTER II

# EVALUATION GUIDELINES

I. Sample

A. Total Pre - 187
B. Total Post - 181
C. Total sample receiving complete pre and post testing for statistical analysis - 164.

II. Sample - Children were between 3 1/2 to 5 1/2 years of age at time of testing.

III. Sample class - Classes consisted of pre kindergarten 3 1/2 to 4 1/2 years old and kindergarten 4 1/2 to 5 1/2 years old.

IV. Sample eligible child - All sample children in the Southern University sample had had summer Head Start experience in that the Head Start centers reopen during the summer months after two to three weeks vacation for the staff.

V. All measures were administered in English.

VI. Pre-testing was conducted during the 19th week and thereafter because of our reckoning the time of the start of testing from the first week of June which was the start of summer Head Start.

VII. Post-testing was conducted during the month of April. This was the best time because the last month of class meetings (May) was devoted to closing activity preparation.

VIII. Time interval - The time interval was 5 1/2 months.

IX. At least fifty per cent of the post-testing was administered by the same tester.

## QUALITY CONTROL

### WPPSI

1. The test was studied intensively over a period of three weeks. Each of the participants tested every other participant, eight adults and seven children. Criticisms of the performances were interchanged, with special emphasis on timing and scoring.

2. Each WPPSI protocol was checked independently for accuracy by two examiners.

### FAMILY INTERVIEW

1. All interviewers and testers participated in a three-day pre and two-day post training session conducted by the co-ordinator.

2. Each participant interviewed three head start mothers. Every completed schedule was checked for accuracy by an independent interviewer. Emphasized in this check was editing so that no blanks would be left under any item.

3. All interviewers met periodically to discuss both general and specific coding problems and the significance of sufficient probing for insuring correct coding of responses was stressed.

4. All interviewers were required to become very familiar with coding, especially in the cases of items dealing with Child-Rearing Practices. When necessary, the mother was asked to re-enact a scene or describe how it happened. The interviewer was admonished constantly against making assumptions about any of the information.

### GUMPGOOKIES

1. Testers studied manual intensively.

2. Testers administered test to each other.

3. Testers administered test to 4 or 5 non-sample children.

4. Testers met periodically to discuss any problems in administration or recording that individual testers might have experienced.

### ITPA

1. Testers studied manual intensively.

2. Testers administered test to non-sample children.

3. Testers administered test to other staff members.

4. Testers concentrated on timing and scoring.

5. Testers listened to record - "Auditory Sequential Memory" to aid in achieving correct rhythm since testers were accustomed to Stanford-Binet type rhythm which they used in last year's test battery.

POT

1. Observers studied manual intensively.
2. Observers took under advisement additional information received from E & R Center responsible for instrument (Syracuse).

HEAD START RESEARCH AND EVALUATION CENTER
SOUTHERN UNIVERSITY
SOUTHERN BRANCH POST OFFICE
BATON ROUGE, LOUISIANA 70813

## CONSENT FOR TESTING AND RESEARCH PARTICIPATION 1969-70

Dear Parent:

The class in which your child is enrolled at ____________ (name of H. S. Center) has been selected as a sample for the national evaluation of Project Head Start. Your child has been selected as one of the participants in an evaluation of the effectiveness of the Head Start Program. We would like your permission to administer certain tests which are part of the national evaluation and have your child participate in our Language and Enrichment Research Classes. All tests will be given by professionally qualified people, and none will endanger your child's safety or welfare. Your cooperation will be greatly appreciated, since this is very important in helping to develop programs for young children that will help them to lead happy and successful lives.

If you are willing to have your child participate in this effort, you may indicate your permission by signing below:

I have no objection to the administration of tests to my child, ____________________ (child's name), as part of the national Head Start Evaluation Program.

________________________________
(Parent's Name)

Sincerely yours,

Edward E. Johnson, Ph.D.
Director

(Miss) Betty J. Franklin
Coordinator

BJF:lw

HEAD START RESEARCH AND EVALUATION CENTER
SOUTHERN UNIVERSITY
SOUTHERN BRANCH POST OFFICE
BATON ROUGE, LOUISIANA 70813

## PARENT INTERVIEWS 1969-70

Dear Parent:

We at Southern University are studying the families and needs of children in our community. This letter is to introduce ____________________________, one of our staff members who would like to speak with you for a few minutes.

We would greatly appreciate your help and cooperation.

Sincerely yours,

Edward E. Johnson, Ph.D.
Director

## EVALUATION DESIGN

From the original random sample of 194 children, 187 remained as part of the evaluation group. Three test instruments were administered to each child in the sample. The tests were administered on a pre-test, post-test basis within a 5 1/2 month interval.

The WPPSI was the first test of the series to be administered. The ITPA, involving two of the twelve subtests followed the WPPSI. The Gumpgookie -- a test of motivation to achieve -- was administered last.

The Post-Observation Teacher Rating Scales (P. O. T.) was administered by each special teacher to the regular head start teacher. The Parent Interview Form was administered after working hours, and at a time convenient to the parents by the Southern University E & R Center staff. In order to check the availability and accessibility of the center and its resources, a Class Facilities and Resources Inventory was completed by the "head teacher" at each center.

## DESCRIPTION OF EVALUATION INSTRUMENTS

### Wechsler Preschool and Primary Scale of Intelligence (WPPSI)

The WPPSI is a result of a cooperative effort to meet a dual need. First there were frequent requests for a downward revision of the Wechsler Intelligence Scale for Children, and second, there was a growing awareness of the desirability of an intelligence scale that would more adequately appraise the abilities of preschool children. The WPPSI is specifically designed for use with children of ages 4 through 6 1/2 years

The WPPSI consists of a battery of subtest, each of which when treated separately may be considered as measuring a different ability, and when combined into a composite score, as a measure of global intellectual capacity. Because the dichotomy has proved diagnostically useful, the test battery is divided into Verbal and Performance Test groups.

## ILLINOIS TEST OF PSYCHOLINGUISTIC ABILITIES (ITPA)

The psycholingustic model on which the ITPA is based attempts to relate those functions whereby the intentions of one individual are transmitted (verbally or nonverbally) to another individual, and reciprocally, functions where by the environment or the intentions of another individual are received and interpreted. It attempts to inter-relate the processes which take place, for example, when one person receives a message, interprets it, or becomes the source of a new signal to be transmitted. It deals with the psychological functions of the individual which operate in communication activities.

Following is a brief description of the two subtests of the ITPA used by Southern University E & R Center:

Auditory Vocal Association - This test taps into the child's ability to relate concepts presented orally.

Verbal Expression - The purpose of this test is to access the ability of the child to express his own concepts vocally.

## GUMPGOOKIES

This instrument was designed to measure the motivation of young children to achieve in school. The essential information upon which the procedures for Gumpgookies were designed was provided by a preliminary study investigating behavior, behavior testing, role playing performance, sorting, paired comparisons and story telling techniques and formats.

The Gumpgookies figure, as well as the child's participation in finding his own Gumpgookie, seems to have enough fascination to hold interest throughout the seventy-five items and give the test unity. It seems to alleviate the anxiety of children threatened by either the testing situation or too close identification with another figure more nearly like themselves.

Gumpgookies is presented in a story format and centers around the imaginary little figures called gumpgookies. Each child is told that he has his own Gumpgookie and that although it looks like all the other Gumpgookies, it follows the child around and behaves exactly as he behaves -- it likes what the child likes and it does what the child does.

In administering the Gumpgookies, the examiners reads the test and points to each Gumpgookie as it is described. The examiner asks the child which object he likes best and he responds by speaking or pointing.

## FAMILY INTERVIEW FORM

The basic purpose of the Family Interview is to elicit from the parents of Head Start children involved in the 1969-70 national evaluation certain in-depth information which will be utilized in describing, evaluating, and suggesting possible changes in the Head Start program. The interview was to be administered following child testing in order to facilitate conversation with the parents. The usefulness of the information obtained for describing and suggesting possible changes in the Head Start program, the value of the parent's help in effecting such changes, and the gratitude for the persons willing to give her time is to be stressed in setting up an interview.

The responses on this instrument involve statements of agreement or disagreement. There are no right or wrong answers, but rather an attempt to gain an understanding of how the parents feel about the various questions.

## POST OBSERVATION TEACHER RATING SCALES (P. O. T.)

This rating scale is a compilation of items received from Bank Street College of Education, Michigan State University, Syracuse University, and the University of Texas. In this scale, the writers tried to provide comprehensive behavior categories which reflect the atmosphere of the classroom as determined by the teacher.

# CHAPTER III

## INTERVENTION DESIGN

The 1969-70 intervention plan for the Southern University Evaluation and Research Center involved fourteen (14) classes in four (4) centers. There were five (5) classes at Bertel T. Winder Head Start Center - two (2) language classes, two (2) enrichment classes and one (1) control class; two (2) classes at CAWSC - both language; five (5) classes at Ryan Head Start Center - two (2) language classes, two (2) enrichment classes and one (1) control class; and there were (2) classes at South Baton Rouge Head Start Center - both enrichment. The children in six (6) of the fourteen (14) classes were exposed to the University of Hawaii Preschool Language Curriculum (UHPLC). There was also a parallel parent program. There were two (2) classes participating in this phase of the intervention, one class from Bertel T. Winder and one class from Ryan. The parents participating at Bertel T. Winder received a monetary supplement while no money was given to the parents at Ryan.

Involved in the Cultural Enrichment Program were six (6) of the eight (8) remaining classes. The other two (2) classes were used as controls. There was also a paralleling parent program. The parents participating in this program were taken from four (4) of the eight (8) enrichment classes with two (2) classes receiving monetary supplement and two (2) classes not receiving monetary supplement. There were also two (2) language classes used, one (1) receiving monetary supplements and one (1) not receiving monetary supplements. The remaining six (6) classes had no parallel parent program. Included in these were two (2) language classes at CAWSC, two (2) enrichment classes at South Baton Rouge, and one control class each at Ryan and Bertel T. Winder centers. (See Table I).

The language parent program was designed to emphasize parental cooperation in developing language skills in their children. The cultural enrichment parent program was designed to provide background information on principles of child development and child-rearing practices. Complete descriptions of the language intervention program and the parent programs now follow.

## PARENTAL INVOLVEMENT PROGRAM

The initial purpose of the parental involvement research design was to incorporate parents of Head Start children as teachers of their children. The design included two distinct parent education programs. These programs were designated as parent program #1 ($PP_1$) and parent program #2 ($PP_2$). The same basic design was a part of last year's program in which case all parents involved in the program received a monetary supplement for each meeting attended. This year, in order to determine the effect of the money as a form of motivation, parents at one center received money (Bertel T. Winder) while parents at Ryan Head Start Center received no money.

The primary purpose of parent program #1 was to involve parents in an ongoing program of teaching their own children language concepts that directly supported the content presented to the children in the classroom. The parents learned the language curriculum, as well as techniques to use with their children, that supplemented the language teacher's presentation in the classroom.

The first of nine meetings served to orient the parents as to the

## INTERVENTION DESIGN

## TABLE I

| | | | | |
|---|---|---|---|---|
| BERTEL T. WINDER H. S.<br>Language Class I<br>Total Sample 11<br>Parent Program #1<br>(With Money)<br>$LP_1$ | BERTEL T. WINDER H. S.<br>Enrichment Class II<br>Total Sample 13<br>Parent Program #2<br>(With Money)<br>$EP_2$ | BERTEL T. WINDER H. S.<br>Enrichment Class III<br>Total Sample 13<br>Parent Program #2<br>(With Money)<br>$EP_2$ | BERTEL T. WINDER H. S.<br>Language Class IV<br>Total Sample 11<br>Parent Program #2<br>(With Money)<br>$LP_2$ | BERTEL T. WINDER H. S.<br>Control Class V<br>Total Sample 11<br>Parent Program (None) |

| | |
|---|---|
| CAWSC HEAD START CENTER<br>Language Class I<br>Total Sample 12<br>Parent Program (None)<br>L | CAWSC HEAD START CENTER<br>Language Class II<br>Total Sample 11<br>Parent Program (None)<br>L |

| | | | | |
|---|---|---|---|---|
| RYAN HEAD START CENTER<br>Language Class I<br>Total Sample 12<br>Parent Program #1<br>(Without Money)<br>$LP_1$ | RYAN HEAD START CENTER<br>Control Class II<br>Total Sample 11<br>Parent Program None) | RYAN HEAD START CENTER<br>Enrichment Class III<br>Total Sample 7<br>Parent Program #2<br>(Without Money)<br>$EP_2$ | RYAN HEAD START CENTER<br>Enrichment Class IV<br>Total Sample 11<br>Parent Program #2<br>(Without Money)<br>$EP_2$ | RYAN HEAD START CENTER<br>Language Class V<br>Total Sample 13<br>Parent Program #2<br>(Without Money)<br>$LP_2$ |

| | |
|---|---|
| SOUTH BATON ROUGE HEAD START<br>Enrichment Class I<br>Total Sample 18<br>Parent Program (None)<br>E | SOUTH BATON ROUGE HEAD START<br>Enrichment Class II<br>Total Sample 15<br>Parent Program (None)<br>E |

functions and practices of Head Start and general pre-school education. The essential objectives were:

1. To provide a warm, non-threatening learning situation.
2. To motivate parents to participate in the classroom.
3. To arouse interest in the learning process.
4. To present the role of the supervising adult in one typical pre-school activity.

Parent educators, following an outline constructed by the staff of the Evaluation and Research Centers at Southern University and the University of Hawaii, were able to introduce and project ideas and methods which directly correlated with the initial research design.

Clay manipulation while role-playing was the activity of the first meeting. The rationale behind the use of clay was that it provided sensory experience and it offered an intermediate step to symbolic representation. The parents were also told how they could use clay manipulation effectively with their children. This same agenda for the first meeting was used by both parent groups regardless of treatment (with or without monetary supplement). This agenda included the following:

1. Introductory remarks by parent educators.
2. Explanation of the program and anticipated parent meetings.
3. Suggestions from parents as to the weeks for parent meetings and possible times.
4. Role-playing.
5. Formal introduction of the parents to the entire group.

In the other eight (8) meetings the parent educators were involved in teaching the effectiveness of making flour and salt dough and collage materials. They also stressed role-playing in which the parents played the role of the child in the language corner and also exchanged roles in playing language-strengthening games.

The objectives of parent program #1 emerged as follows:

1. To determine ways in which parents might teach their children at home.
2. To analyze messages, motivation and feedback in a teaching situation.
3. To establish an atmosphere of learning together as parents and staff members.
4. To give parents the experience of teaching each other.

The meaning of these objectives was intensified by the use of a series of 16mm films prepared by the University of Hawaii entitled, "Helping Head Start: Parent Teaching," by Jean Fargo. The content of the discussions and supplementary activities were dependent upon the task and objectives of the individual language teachers.

Parents worked with their children for at least ten minutes per day at home in a prescribed language activity. These lessons were selected to reinforce the classroom teacher's language lesson content and those supplementary activities which were directly related to language-strengthening.

Records of assignments and independent language activities were kept by the parents concerning the following categories: Looking at pictures, reading a story, books or magazines, conversing with the child, playing a language game (suggestions for which were offered in parent meetings by the parent educators), and sharing in activities that required verbal exchange. The content and range of these activities were left to the discretion of the parents. Gold stars placed on a master chart at each parent session were used to indicate how each parent actually worked with her child. Therefore, the activity involving looking at a picture book might have fifteen to twenty stars, one for each child, posted in the appropriate section for each week. Thus, each parent was able to see how her work compared with the work of other parents in the program. A similar type of reinforcement was used daily by the language teacher as a means of rewarding each child for good language work in the classroom.

Jerome S. Bruner's[1] plan for cognitive growth was used as a guide for parent program #2. Bruner asserts that cognitive development moves from the inactive or active through the iconic or image to the symbolic or word. Parent program #2 was designed to provide background information on principles of child development and child-rearing practices. The three basic procedures used with parents of Head Start children involved in this program were:

1. The establisment of rapport and involvement through the use of art activities.
2. The establishment of interpersonal relationships and individual development through the use of audio-visual materials and group discussions.
3. The sharing of experiences through exchange of child-rearing practices, and ways of coping with specific related problems.

Meeting number one (1) followed the same agenda as that of parent program #1. Emphasis was placed on parents developing skills that would increase their effectiveness as classroom volunteers. Monetary supplements were also awarded to those parents who had been previously designated as recipients. This money was also dependent upon attendance. The attendance roles also showed that those parents receiving monetary supplements attended more meetings.

---

[1] Jerome S. Bruner, "The Course of Cognitive Growth," American Psychologist, 19, pp. 1-15, 1962.

The content of the successive eight (8) meetings revealed the essential differences between the two programs. The parent educators provided parents with methods of understanding early childhood development and child-rearing practices. They strengthened their objectives through the use of movies and assorted activities. The films included "The Umbrella", "Children's Emotions", "Creative Art", "Fears of Children", "Poems Can Be Fun", "Jamie: Story of A Sibling", "Frustrating Fours and Fascinating Fives", and "Helping Head Start #4" part of the series by Jean Fargo. A slide, "How Babies Are Made", was shown which evoked a very good discussion. The parents later created a booklet "Questions Children Ask About Sex." With the aid of this booklet parent educators and parents were better able to discuss this important subject. The purposes of the discussions after each film was to get parents to realize the importance of the following:

1. helping children get along with their peers
2. understanding the developmental levels of children
3. understanding problems in social relationships among children
4. understanding their roles as interpreters for their children

During the meetings parents were engaged in many activities. These activities were prepared by the parent educators as a means of projecting the objectives of parent program #2. These activities included the making of flour and salt dough, during which time the parents made various objects out of the clay-like mixture. The parent educators also gave the "how and why" of using paints as an art activity. The parents participating in this session shared in the mixing of this home made paint. Many of the activities involved the use of paper materials, i.e., flowers from crepe paper, nursery rhyme booklets, booklets on "Questions Children Ask About

Sex," and wall plaques out of egg cartons.

The monthly meetings were presented in three steps:

1. As a means of strengthening communication and providing parents with the means of sharing specific activities with their children, Art Media was used. There were different treatments for the parent groups but the basic activities were the same. However, the parent groups moved at different speeds thereby different emphasis for the group as a whole were used in accordance with its individual members.

The specific goals of this step were basically the same as prescribed for last year:

   a. To facilitate parents recognition of the value of inherent order as it relates to the development of children.

   b. To facilitate parents recognition of the value of art experiences as a vehicle for discovering, exploring, and sharing their feelings.

   c. To facilitate parents recognition of the need to accept variation and uniqueness in human development and potential.

2. Visual art, music, and audio-visual materials were used during the second stage. These activities were enjoyed by the parents as stimulants for group discussions. This also provided the parent educators with tools for showing parents within the group how best to develop closer intra-family relationships.

3. The final step used by the parent educators involved direct confrontation with problems related to parental guidance and child-rearing practices. As a means of developing practical solutions to these problems, hypothetical and real situations were presented by the parent educators and parents for use in role-playing situations. These sessions allowed parents to seek better ways of solving problems and to broaden their

perspective in the use of acceptable child-rearing methods.

Parent educators in parent programs 1 and 2 sought to make parents cognizant of the need to develop an awareness of the importance of better and more effective language usage by themselves and their children. They also encouraged parents to become aware of problems in early childhood development and realize that there are alternative solutions to these problems.

# CHAPTER IV

## PROGRAMS

Class Type 1 Designated as $EP_2$ - Enrichment class two: Children received an enrichment treatment; parents received the enrichment treatment.

Class Type 2 Designated as $LP_1$ - Language class one: Children received a language treatment; parents received the language treatment.

Class Type 3 Designated as $LP_2$ - Language class two: Children received a language treatment; parents received the language treatment.

Class Type 4 Designated as C - Control class: Children were tested but received no treatment; parents were not involved.

Class Type 5 Designated as E - Enrichment class: Children received an enrichment treatment; parents were not involved.

Class Type 6 Designated as L - Language class: Children received a language treatment; parents were not involved.

## STATISTICAL ANALYSIS

An analysis was performed on the change from pre-test to post-test for all categories of the Weschler Preschool and Primary Scale of Intelligence and the Illinois Test of Psycholinguistic Abilities. The analysis was done using the least squares analysis for unequal subclass numbers to evaluate the effect of the six (6) programs, parent participation in three programs, interaction between program and participation for those three programs where participation of parents was included and the effect of pre-score (pre-test performance) on the amount of growth (change) from pre to post test. Orthogonal comparisons were made among the programs and in the interactions in order to more completely describe possible differences among the programs. Because of the children's being grouped into classes within program, the variation among classes within program was partitioned out of the error term.

## VERBAL SCALE SCORE (WPPSI)

An analysis of variance revealed that pre-score had a highly significant effect on this variable, ($F = 50.06$, d.f. = 1/151, $p. < .01$). There was a highly significant difference between the programs, ($F = 16.19$, d.f. = 5/151, $p < .01$) with the control being highly significantly inferior to the average of the treated groups ($F = 42.31$, d.f. = 1/151, $p < .01$). The enrichment and language programs were superior when parents were not included ($F = 25.97$, d.f. = 1/151, $p < .01$). In addition, the language program was superior to the enrichment program when parents were not included ($F = 10.69$, d.f. = 1/151, $p < .01$).

## PERFORMANCE SCALED SCORE (WPPSI)

There was a significant difference between programs (F = 10.79, d.f. = 5/151, $p < .01$) with the control group being significantly inferior to the treated groups (F = 19.66, d.f. = 1/151, $p < .01$). The children performed significantly better in the language and enrichment programs when parents were not involved (F = 9.11, d.f. = 1/151, $p < .01$). The language programs were superior to the enrichment programs (F = 18.51, d.f. = 1/151, $p < .01$), and the language program where parents were invited to participate in a language parent program was superior to the language program where parents were invited to participate in an enrichment parent program (F = 16.90, d.f. = 1/151, $p < .01$).

## FULL SCALE SCORE (WPPSI)

The effects of pre-testing were highly significant as it related to the scores obtained in the post-testing (F = 28.68, d.f. = 1/151, $p < .01$). There was a significant variation among programs (F = 15.51, d.f. = 5/151, $p < .01$) with the control group being highly significantly inferior to the average of the treated groups (F = 41.40, d.f. = 1/151, $p < .01$). Children involved in language and enrichment programs scored significantly higher on this subtest when the parents were not included (F = 16.51, d.f. = 1/151, $p < .01$). In addition, when parents were not included in the program, the language program was superior to the enrichment (F = 9.14, d.f. = 1/151, $p < .01$), and the language program was superior to the enrichment program when parents were involved (F = 7.79, d.f. = 1/151, $p < .01$).

## INFORMATION SCALED SCORE (WPPSI)

The pre-score obtained had a significant effect upon post performance ($F = 23.44$, d.f. = 1/151, $p < .01$). There was a significant variation among the classes that participated in the programs ($F = 3.09$, d.f. = 8/151, $p < .01$). A significant variation among programs was found ($F = 14.98$, d.f. = 5/151, $p < .01$) with the control group being significantly inferior to the average of the treated groups ($F = 31.70$, d.f. = 1/151, $p < .01$). The programs involving parents were significantly inferior to programs not involving parents ($F = 20.57$, d.f. = 1/151, $p < .01$). When parents were not involved, the language program was superior to the enrichment program ($F = 25.25$, d.f. = 1/151, $p < .01$).

## VOCABULARY SCALED SCORES (WPPSI)

Pre-score had a highly significant effect on post performance ($F = 103.06$, d.f. = 1/151, $p < .01$). The control group was significantly inferior to the average of the treated groups ($F = 9.08$, d.f. = 1/151, $p < .01$). Parental participation interacted with $EP_2$, $LP_1$ and $LP_2$. There was a greater difference between children of participating parents of the enrichment class ($EP_2$) and children of non-participating parents of the language classes ($LP_1$, $LP_2$) than there was between children of non-participating parents of the enrichment class ($EP_2$) and children of participating parents of the language classes ($LP_1$, $LP_2$). ($F = 12.14$, d.f. = 1/151, $p < .01$).

## ARITHMETIC SCALED SCORE (WPPSI)

An analysis of variance revealed that pre-score had a highly significant effect on this variable ($F = 86.58$, d.f. = 1/151, $p < .01$). There was a significant effect derived from the interaction 1,4,6 vs 2,3,5 which revealed a greater difference between children of non-participating parents in the enrichment program and participating parents in the language programs than between children of participating parents in the enrichment program and non-participating parents in the language programs. A significant variation was found to exist between the programs ($F = 9.99$, d.f. = 5/151, $p < .01$) with the control group being significantly inferior to the average of the treated groups. Children performed significantly better on this variable when the parents were not included ($F = 13.81$, d.f. = 1 /151, $p < .01$), but when parents were included, the enrichment class was significantly superior to the language classes ($F = 11.11$, d.f. = 1/151, $p < .01$).

SIMILARITIES SCALED SCORE (WPPSI)

Pre-score as it relates to post performance, had a significant effect ($F = 186.07$, d.f. = 1/151, $p < .01$). The interactional effect of 1,4,6 vs 2,3,5 was significant ($F = 9.45$, d.f. = 1/151, $p < .01$). It revealed that the difference was greater between the children of participating parents in the enrichment program and children of non-participating parents in the language programs than it was between children of non-participating parents in the enrichment program and children of participating parents in the language programs. Some variations among classes were significant ($F = 8.27$, d.f. = 5/151, $p < .01$). The control group was significantly inferior to the average of the treated groups ($F = 21.58$, d.f. = 1/151, $p < .01$). The children performed significantly higher when parents were not involved in the treatment ($F = 12.69$, d.f. = 1/151, $p < .01$).

## COMPREHENSION SCALED SCORE (WPPSI)

An analysis of variance revealed that pre-score had a significant effect upon post performance ($F = 112.71$, d.f. = 1/151, $p < .01$). There were significant variations among the classes that participated in the program ($F = 5.22$, d.f. = 8/151, $p < .01$). Interactional effects were significant ($F = 15.22$, d.f. = 1/151, $p < .01$). This showed the difference between children of non-participating parents in the enrichment program and those of participating parents in the language program to be greater than the difference between children of participating parents in the enrichment program and those of non-participating parents in the language program. The children of participating parents performed significantly better on this variable ($F = 10.17$, d.f. = 1 /151, $p < .01$. There was significant variation between the programs($F = 6.82$, d.f. = 5/151, $p < .01$) with performance being significantly greater where parents were not included ($F = 15.07$, d.f. = 1/151, $p < .01$).

## ANIMAL HOUSE SCALED SCORE (WPPSI)

The pre-score obtained had a significant effect upon post-testing ($F = 44.01$, d.f. = 1/151, $p < .01$). Variation among programs was significant ($F = 4.92$, d.f. = 5/151, $p < .01$). The control group was significantly inferior to the average of the treated groups ($F = 11.55$, d.f. = 1/151, $p < .01$). For programs involving parental participation, the enrichment program was significantly inferior to the language programs ($F = 8.74$, d.f. = 1/151, $p < .01$).

## PICTURE COMPLETION SCALED SCORE (WPPSI)

The effects of pre-testing were significant as it related to the scores obtained in the post-testing ($F = 52.95$, d.f. = 1/151, $p < .01$). Variations among programs were significant ($F = 8.16$, d.f. = 5/151, $p < .01$). The control class was significantly inferior to the average of the treated groups ($F = 25.34$, d.f. = 1/151, $p < .01$). Performance on this variable was best for programs involving no parental participation ($F = 9.39$, d.f. = 1/151, $p < .01$).

## MAZES SCALED SCORE (WPPSI)

An analysis of variance revealed that only pre-testing had an effect upon post-testing ($F = 22.10$, d.f. = 1/151, $p < .01$).

## GEOMETRIC DESIGN SCALED SCORE (WPPSI)

The results denoting the change in the sum of geometric design scale score as reflected by an analysis of variance revealed pre-score had a highly significant effect on post-score results ($F = 65.60$, d.f. = 1/151, $p < .01$). The variation among classes within program was significant ($F = 3.47$, d.f. = 8/151, $p < .01$). Participation of parents had no effect nor did it interact with $EP_2$, $LP_1$ and $LP_2$. A highly significant difference occurred between the programs, with the control group being highly significantly inferior to the average of the treated groups. However, from a comparison of $EP_2$, $LP_1$, LP2 vs 5,6, a highly significant difference was found when parents participated ($F = 8.14$, d.f. = 1/151, $p < .01$). In addition, the language program is highly significantly superior to the enrichment program when parents are included ($F = 19.58$, d.f. = 1/151, $p < .01$). Also, children of parents participating in $LP_1$ performed significantly better than children of parents participating in $EP_2$ ($F = 7.34$, d.f. = 1/151, $p < .01$). The interactional effect among the participating parents of $EP_2$ and the non-participating parents of $LP_1$ and $LP_2$ was highly significantly inferior to the interaction among the non-participating parents of $EP_2$ and the participating parents of $LP_1$, $LP_2$ ($F = 10.73$, d.f. = 1/151, $p < .01$).

## BLOCK DESIGN SCALED SCORE (WPPSI)

Pre-score had a highly significant effect on this variable ($F = 92.60$, d.f. = 1/151, $p < .01$). The variation among classes within program was also significant ($F = 2.72$, d.f. = 8/151, $p < .01$). Parental participation had no effect on this variable nor did it interact with $EP_2$, $LP_1$ and $LP_2$. In addition, the language and enrichment programs were highly significantly superior when there were no parents involved. ($F = 11.90$, d.f. = 1/151, $p < .01$). The effect of overall usage of programs also had a significant effect on this variable ($F = 4.27$, d.f. = 5/151, $p < .01$).

## SUM OF RAW SCORES PRORATED (WPPSI)

An analysis of variance on the total sum of prorated raw scores of the WPPSI showed that pre-score had a highly significant effect on this variable ($F = 20.64$, d.f. = 1/151, $p < .01$). It was also found that there was a significant variation among classes within programs ($F = 3.76$, d.f. = 8/151, $p < .01$). Also, there was a significant difference between the programs with the average of the treated groups being inferior to the control ($F = 4.60$, d.f. = 5/151, $p < .01$). A highly significant difference was found between $EP_2$ and $LP_1$, $LP_2$ with the language parent program being highly significantly superior to the enrichment parent program ($F = 16.08$, d.f. = 1/151, $p < .01$).

## PSYCHOLINGUISTIC AGE IN MONTHS ITPA
## (Based on prorated sum of raw scores)

The only significant F found in the psycholinguistic age in months of the ITPA was in the classes within programs ($F = 8.00$, d.f. = 8/151, $p < .01$). Parent participation had a significant effect on the programs.

## AUDITORY ASSOCIATION SCALED SCORE (ITPA)

A highly significant F was obtained from a least squares analysis of variance on the pre-score effect on this subtest of the ITPA ($F = 31.63$, d.f. = 1/151, $p < .01$). There was significant variation among classes within program ($F = 3.34$, d.f. = 8/151, $p < .01$). There was no interaction among $EP_2$, $LP_1$ and $LP_2$ and parental participation had no significant effect.

## VERBAL EXPRESSION SCALED SCORE (ITPA)

The variation among classes within program had a highly significant effect on this variable ($F = 4.09$, d.f. = 8/151, $p < .01$). Also, the effects of pre-testing was highly significant as it related to the scores obtained in post-testing ($F = 53.90$, d.f. = 1/151, $p < .01$). There were no other significant differences found in the analysis of variance performed on this variable.

An analysis of variance was also performed on the ten categories of responses in Verbal Expression: Labels, Colors, Shapes, Compsoition, Function, Major Parts, Numerosity, Other Characteristics, Person, Place or Thing, and Comparisons. The analysis of the ten categories now follow.

## LABEL (CATEGORY ITPA)

The results obtained on pre-score performance had a highly significant effect on post-score results ($F = 121.95$, d.f. = 1/151, $p < .01$).

Two orthogonal comparisons of the effect of parent participation in programs showed highly significant differences. It was found that there was a positive interaction among non-participating parents of $EP_2$ and participating parents of $LP_1$ and $LP_2$ as opposed to the participating parents of $EP_2$ and the non-participating parents of $LP_1$ and $LP_2$, ($F = 22.98$, d.f. = 1/151, $p < .01$). The second comparison showed a greater interaction between the non-participating parents of $LP_1$ and the participating parents of $LP_2$ than the participating parents of $LP_1$ and non-participating parents of $LP_2$ ($F = 18.11$, d.f. = 1/151, $p < .01$).

## COLOR (CATEGORY ITPA)

On this category of the ITPA pre-score had a highly significant effect on post-score performance ($F = 182.11$, d.f. = 1/151, $p < .01$).

The only significant orthogonal comparison found was the interactional effect of parental participation in $LP_1$ and non-participation in $LP_2$ being highly significantly superior to the interactional effect of no parental participation in $LP_1$ and parental participation in $LP_2$ ($F = 15.56$, d.f. = 1/151, $p < .01$).

## SHAPE (CATEGORY ITPA)

A highly significant variation among classes within program was found for this category of the ITPA ($F = 31.80$, d.f. = 8/151, $p < .01$). Again, pre-score had a highly significant effect on post-score results ($F = 36.03$, d.f. = 1/151, $p < .01$). A significant difference was found when parents were involved in the programs as opposed to when they were not involved

($F = 8.87$, d.f. = 1/151, $p < .01$). A second orthogonal comparison revealed a highly significant difference between the enrichment parent program ($EP_2$) and the language parent programs ($LP_1$, $LP_2$), with $LP_1$, $LP_2$ being superior to $EP_2$ ($F = 6.96$, d.f. = 1/151, $p < .01$).

### COMPOSITION (CATEGORY ITPA)

The interactional effect among the participating parents of $EP_2$ and the non-participating parents of $LP_1$ and $LP_2$ was significantly less than the interactional effect of the non-participating parents of $EP_2$ and the participating parents of $LP_1$ and $LP_2$ ($F = 15.19$, d.f. = 1/151, $p < .01$). Also, there was a significantly greater interactional effect between the non-participating parents of $LP_1$ and the participating parents of $LP_2$ than the participating parents of $LP_1$ and the non-participating parents of $LP_2$ ($F = 32.58$, d.f. = 1/151, $p < .01$).

### FUNCTIONS (CATEGORY ITPA)

The only significant F found for Functions in the verbal expression subtest of the ITPA was for pre-score effect on post-score performance ($F = 58.66$, d.f. = 1/151, $p < .01$).

### MAJOR PARTS (CATEGORY ITPA)

On major parts of the ITPA pre-score performance had a highly significant effect ($F = 2122.64$, d.f. = 1/151, $p < .01$). There was not a significant variation among classes within programs on this variable ($F = .73$, d.f. = 8/151, $p > .01$). However, orthogonal comparisons of 1,4,6 vs 2,3,5 showed that the interactional effect among non-participating parents of $EP_2$ and the participating parents of $LP_1$ and $LP_2$ were more significant than participating parents of $EP_2$ and non-participating parents of $LP_1$ and $LP_2$ ($F = 37.97$, d.f. = 1/151, $p < .01$).

## NUMEROSITY (CATEGORY ITPA)

An orthogonal comparison of the interactional effect among 1,4,6 vs 2,3,5 for this variable showed that non-participating parents of $EP_2$ interacted more with participating parents of $LP_1$ and $LP_2$ than did the participating parents of $EP_2$ with the non-participating parents of $LP_1$ and $LP_2$ ($F = 116.68$, d.f. = 1/151, $p < .01$). In addition, there was also a significant interactional effect between the participating and non-participating parents of $LP_1$ and $LP_2$ (3,6 vs 4,5), ($F = 47.51$, d.f. = 1/151, $p < .01$). Pre-score had a highly significant effect on post-score results ($F = 517.27$, d.f. = 1/151, $p < .01$).

## COMPARISON (CATEGORY ITPA)

The only significant F on this category was the pre-score effect ($F = 89.63$, d.f. = 1/151, $p < .01$).

## OTHER CHARACTERISTICS (CATEGORY ITPA)

The interactional effect among 1,4,6 vs 2,3,5 for this variable showed that non-participating parents of $EP_2$ interacted more with participating parents of $LP_1$ and $LP_2$ than did the participating parents of $EP_2$ with the non-participating parents of $LP_1$ and $LP_2$ ($F = 54.63$, d.f. = 1/151, $p < .01$). Also, the participating parents of $LP_1$ and non-participating of $LP_2$ interacted greater than the participating parents of $LP_2$ and the non-participating of $LP_1$ ($F = 16.76$, d.f. = 1/151, $p < .01$). Pre-score had a highly significant effect on post-score results ($F = 61.67$, d.f. = 1/151, $p < .01$).

## PERSON, PLACE OR THING (CATEGORY ITPA)

On this variable, the enrichment program was highly significantly superior to the language program with no parental participation (F = 8.58, d.f. = 1/151, p .01). Pre-score had a highly significant effect on post-score results (F = 43.98, d.f. = 1/151, $p < .01$).

## NUMBER OF DIFFERENT CATEGORIES OF CREDITED RESPONSES (CATEGORY OF ITPA)

Pre-score was the only significant F reported (F = 70.81, d.f. = 1/151, $p < .01$).

## CHRONOLOGICAL AGE IN MONTHS

The chronological age at time of testing showed only one significant F on a least squares analysis of variance. Pre-score had a highly significant effect on post-score results (F = 10.92, d.f. = 1/151, $p < .01$).

# FINDINGS

The initial research design as set forth in the 1968-69 Southern University Evaluation and Research Center Annual Report concentrated on the effects of two separate and distinct programs--language and enrichment. This year, however, there was an attempt to measure the following:

1. the performance on certain test and subtests, of a control group as opposed to those groups receiving the language or the enrichment program.
2. the effects of parental involvement in either program (language or enrichment) and no parental involvement in either program.
3. the over-all effects of the two basic programs, (language and enrichment) with no parental participation designed.
4. the effects of the enrichment parent program two ($EP_2$) as opposed to the two language parent programs ($LP_1$ and $LP_2$).
5. the effects of language parent program one ($LP_1$) as opposed to language parent program two ($LP_2$).
6. the effects of overall parental participation as opposed to non-participation regardless of treatment. Also tested were the interactions between:
    a. the enrichment and language programs and participation.
    b. the type of language program ($LP_1$, $LP_2$) and participation.
7. the effects of the pre-scores obtained in pre-testing on post-test performance involving the same tests and subtests.
8. the effects of marked variations among classes (and teachers) within the program on test performance.

The above mentioned eight (8) categories of comparisons were stated in an effort to add clarity to the interpretation of the data subjected to a least-squares analysis of variance. The analysis assessed the relevance of these treatments as they relate to the various programs and also to the children and parents involved in those programs.

As a result of the analysis, it was found that for all variables tested pre-score had a highly significant effect on post-score results. It was noted that those children who performed well during the pre-test tended to excel during post-testing.

When the variation among classes within programs was partitioned out of the error team, it was found highly significant for most variables tested. This suggests that most children did not have essentially the same basic skills and their growth was dependent upon growth within the program along with capabilities of teachers and the intellectual capacities of the children.

As was reported last year, parental participation seemed to have no effect nor did it interact with $EP_2$, $LP_1$ and $LP_2$. Significant F's were found for language and enrichment parent programs. However, more significant F's were found for the language parent programs than for enrichment parent program. In addition, the language program was superior to the enrichment program when parents were not included.

The control group was highly significantly inferior to the average of the treated groups (4 vs 1,2,3,5,6) on all sub-tests used of the WPPSI. However, the control group was significantly superior to the treated groups on the sum of pro-rated raw scores of the WPPSI. In addition, on the ITPA the same general trend held true where significant F's were found.

Following are general findings of this study:

1. There was essentially no difference among language and enrichment programs when parents were included.

2. The language program was superior to the enrichment program when parents were not included.

3. The control group's performance was inferior to the performance of the groups receiving treatments.

4. Parental participation did not have significant influence on the outcome of the total program.

5. There was a significant variation among classes within programs on most variables tested.

# APPENDIX I

## ANALYSIS OF VARIANCE CHARTS

TABLES 1 - 49

## SUM OF VERBAL SCALE SCORE

## Analysis of Variance Table

| | Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|---|
| | Total | 168 | | | |
| | Programs | 5 | 3378.79 | 675.76 | 16.19* |
| C vs treated | 4 vs 1,2,3,5,6 | 1 | 1766.52 | 1766.52 | 42.31* |
| $EP_2$, $LP_1$, $LP_2$, vs E,L | 1,2,3 vs 5,6 | 1 | 1084.13 | 1084.13 | 25.97* |
| E vs L | 5 vs 6 | 1 | 446.11 | 446.11 | 10.69* |
| $EP_2$ vs $LP_1$, $LP_2$ | 1 vs 2,3 | 1 | 2.88 | 2.88 | 0.07* |
| $LP_1$ vs $LP_2$ | 2 vs 3 | 1 | 18.62 | 18.62 | 0.45 |
| | Participation vs Non-Part. | 1 | 40.16 | 40.16 | 0.96 |
| | Program x Participation | 2 | 75.21 | 37.61 | 0.90 |
| | 1] cells 1,4,6 vs 2,3,5 | 1 | 113.51 | 113.51 | 2.72 |
| | 2] cells 3,6 vs 4,5 | 1 | 41.83 | 41.83 | 1.00 |
| | 3] Class/Program | 8 | 539.20 | 67.40 | 1.61 |
| | Pre-Score Effect | 1 | 2089.81 | 2089.81 | 50.06* |
| | Error | 151 | 6303.80 | 41.747 | |

P 0.01

1. Interaction between program type (EP, LP) and participation.
2. Interaction between type of language program ($LP_1$, $LP_2$) and participation.
3. Due to children being grouped into classes within program, the variation among classes within program (including variation among teachers within program) was partitioned out of the error term in order to provide a more efficient evaluation among treatments.

## VERBAL IQ (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 5439.93 | 1087.99 | 15.98* |
| 4 vs 1,2,3,5,6 | 1 | 2957.68 | 2957.68 | 43.44* |
| 1,2,3 vs 5,6 | 1 | 1564.12 | 1564.12 | 22.97* |
| 5 vs 6 | 1 | 853.72 | 853.72 | 12.54* |
| 1 vs 2,3 | 1 | .68 | .68 | .01 |
| 2 vs 3 | 1 | .89 | .89 | .01 |
| Participation vs Non-Part. | 1 | 55.42 | 55.42 | .81 |
| Program x Participation | 2 | 151.76 | 14.41 | 0.21 |
| 1) cells 1,4,6 vs 2,3,5 | 1 | 214.47 | 214.47 | 3.15 |
| 2) cells 3,6 vs 4,5 | 1 | 98.52 | 98.52 | 1.45 |
| 3) Class/Program | 8 | 642.14 | 80.27 | 1.18 |
| Pre-Score Effect | 1 | 4554.50 | 4554.50 | 66.89* |
| Error | 151 | 10280.90 | 68.09 | |

## PERFORMANCE SCALED SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 2789.29 | 557.86 | 10.79* |
| 4 vs 1,2,3,5,6 | 1 | 1016.38 | 1016.38 | 19.66* |
| 1,2,3 vs 5,6 | 1 | 470.87 | 470.87 | 9.11* |
| 5 vs 6 | 1 | 141.60 | 141.60 | 2.74 |
| 1 vs 2,3 | 1 | 956.78 | 956.78 | 18.51* |
| 2 vs 3 | 1 | 873.70 | 873.70 | 16.90* |
| Participation vs Non-Part. | 1 | 4.39 | 4.39 | .09 |
| Program x Participation | 2 | 238.36 | 119.18 | 2.31 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 258.23 | 258.23 | 4.99 |
| 2 cells 3,6 vs 4,5 | 1 | 168.22 | 168.22 | 3.25 |
| 3 Class/Program | 8 | 538.01 | 67.25 | 1.30 |
| Pre-Score Effect | 1 | 1128.19 | 1128.19 | 21.82* |
| Error | 151 | 7806.45 | 51.70 | |

## PERFORMANCE RAW SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Squares | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 5403.88 | 1080.78 | 11.01* |
| 4 vs 1,2,3,5,6 | 1 | 1890.63 | 1890.63 | 19.26* |
| 1,2,3 vs 5,6 | 1 | 1098.18 | 1098.18 | 11.19* |
| 5 vs 6 | 1 | 355.39 | 355.39 | 3.62 |
| 1 vs 2,3 | 1 | 1672.44 | 1672.44 | 17.04* |
| 2 vs 3 | 1 | 174.41 | 174.41 | 1.78 |
| Participation vs Non-Part. | 1 | 14.13 | 14.13 | .14 |
| Program x Participation | 2 | 486.89 | 243.45 | 2.48 |
| 1/ cells 1,4,6 vs 2,3,5 | 1 | 525.48 | 525.48 | 5.35 |
| 2/ cells 3,6 vs 4,5 | 1 | 377.77 | 377.77 | 3.85 |
| 3/ Class/Program | 8 | 953.56 | 119.20 | 1.21 |
| Pre-Score Effect | 1 | 2540.19 | 2540.19 | 25.88* |
| Error | 151 | 14820.30 | 98.15 | |

## FULL SCALE SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 10867.85 | 2173.57 | 15.51* |
| 4 vs 1,2,3,5,6 | 1 | 5800.28 | 5800.28 | 41.40* |
| 1,2,3 vs 5,6 | 1 | 2313.05 | 2313.05 | 16.51* |
| 5 *vs* 6 | 1 | 1281.37 | 1281.37 | 9.14* |
| 1 *vs* 2,3 | 1 | 1091.51 | 1091.51 | 7.79* |
| 2 *vs* 3 | 1 | 138.99 | 138.99 | .99 |
| Participation vs Non-Part. | 1 | 31.11 | 31.11 | .22 |
| Program x Participation | 2 | 599.45 | 299.72 | 2.14 |
| 1) cells 1,4,6 *vs* 2,3,5 | 1 | 647.62 | 647.62 | 4.62 |
| 2) cells 3,6 *vs* 4,5 | 1 | 496.86 | 496.86 | 3.55 |
| 3) Class/Program | 8 | 1289.11 | 161.139 | 1.15 |
| Pre-Score Effect | 1 | 4018.10 | 4018.10 | 28.68* |
| Error | 151 | 21157.70 | 140.12 | |

## IQ EQUIVALENT OF FULL SCALE SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 5615.29 | 1123.06 | 15.22* |
| 4 *vs* 1,2,3,5,6 | 1 | 3034.99 | 3034.99 | 41.14* |
| 1,2,3 *vs* 5,6 | 1 | 1161.57 | 1161.57 | 15.74* |
| 5 *vs* 6 | 1 | 716.79 | 716.79 | 9.72* |
| 1 *vs* 2,3 | 1 | 523.21 | 523.21 | 7.09* |
| 2 *vs* 3 | 1 | 72.74 | 72.74 | .99 |
| Participation vs Non-Part. | 1 | 19.55 | 19.55 | .26 |
| Program x Participation | 2 | 310.11 | 155.05 | 2.10 |
| [1] cells 1,4,6 *vs* 2,3,5 | 1 | 356.40 | 356.40 | 4.83 |
| [2] cells 3,6 *vs* 4,5 | 1 | 245.45 | 245.45 | 3.33 |
| [3] Class/Program | 8 | 628.09 | 78.51 | 1.06 |
| Pre-Score Effect | 1 | 2144.57 | 2144.57 | 29.07* |
| Error | 151 | 11139.82 | 73.77 | |

## INFORMATION RAW SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 272.51 | 54.50 | 8.04* |
| 4 vs 1,2,3,5,6 | 1 | 176.94 | 176.94 | 26.11* |
| 1,2,3 vs 5,6 | 1 | 32.88 | 32.88 | 4.85 |
| 5 vs 6 | 1 | 80.23 | 80.23 | 11.84* |
| 1 vs 2,3 | 1 | 5.02 | 5.02 | .74 |
| 2 vs 3 | 1 | .03 | .03 | .00 |
| Participation vs Non-Part. | 1 | 2.26 | 2.26 | .33 |
| Program x Participation | 2 | 8.84 | 4.42 | 0.65 |
| 1] cells 1,4,6 vs 2,3,5 | 1 | 1.50 | | .22 |
| 2] cells 3,6 vs 4,5 | 1 | 19.10 | | 2.82 |
| 3] Class/Program | 8 | 230.48 | 28.81 | 4.25* |
| Pre-Score Effect | 1 | 198.64 | 198.64 | 29.32* |
| Error | 151 | 1023.12 | 6.78 | |

## INFORMATION SCALED SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 418.77 | 83.75 | 14.98* |
| 4 vs 1,2,3,5,6 | 1 | 177.09 | 177.09 | 31.70* |
| 1,2,3 vs 5,6 | 1 | 114.96 | 114.96 | 20.57* |
| 5 vs 6 | 1 | 142.91 | 142.91 | 25.25* |
| 1 vs 2,3 | 1 | 8.99 | 8.99 | 1.61 |
| 2 vs 3 | 1 | 0.00 | 0.00 | 0.00 |
| Participation vs Non-Part. | 1 | .52 | .52 | .09 |
| Program x Participation | 2 | 1.22 | 0.61 | 0.11 |
| 1/ cells 1,4,6 vs 2,3,5 | 1 | .46 | .46 | .08 |
| 2/ cells 3,6 vs 4,5 | 1 | 8.08 | 8.08 | 1.44 |
| 3/ Class/Program | 8 | 138.28 | 17.28 | 3.09* |
| Pre-Score Effect | 1 | 131.02 | 131.02 | 23.44* |
| Error | 151 | 844.10 | 5.59 | |

## VOCABULARY RAW SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 264.36 | 52.87 | 5.63* |
| 4 vs 1,2,3,5,6 | 1 | 110.57 | 110.57 | 11.76* |
| 1,2,3 vs 5,6 | 1 | 11.98 | 11.98 | 1.28 |
| 5 vs 6 | 1 | 131.38 | 131.38 | 13.98* |
| 1 vs 2,3 | 1 | 4.33 | 4.33 | .46 |
| 2 vs 3 | 1 | 9.32 | 9.32 | .92 |
| Participation vs Non-Part. | 1 | 1.55 | 1.55 | .16 |
| Program x Participation | 2 | 16.85 | 8.42 | 0.90 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 54.45 | 54.45 | 5.79 |
| 2 cells 3,6 vs 4,5 | 1 | .22 | .22 | .02 |
| 3 Class/Program | 8 | 169.68 | 21.21 | 2.26 |
| Pre-Score Effect | 1 | 1056.22 | 1056.22 | 112.39* |
| Error | 151 | 1419.03 | 9.40 | |

## VOCABULARY SCALED SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 39.88 | 7.98 | 2.50 |
| 4 vs 1,2,3,5,6 | 1 | 28.99 | 28.99 | 9.08* |
| 1,2,3 vs 5,6 | 1 | 1.23 | 1.23 | .38 |
| 5 vs 6 | 1 | 5.66 | 5.66 | 1.77 |
| 1 vs 2,3 | 1 | .16 | .16 | .36 |
| 2 vs 3 | 1 | .00 | .00 | .00 |
| Participation vs Non-Part. | 1 | 2.81 | 2.81 | .88 |
| Program x Participation | 2 | 16.30 | 8.15 | 2.55 |
| 1/ cells 1,4,6 vs 2,3,5 | 1 | 38.79 | 38.79 | 12.14* |
| 2/ cells 3,6 vs 4,5 | 1 | 2.21 | 2.21 | .69 |
| 3/ Class/Program | 8 | 48.96 | 6.12 | 1.92 |
| Pre-Score Effect | 1 | 329.12 | 329.12 | 103.06* |
| Error | 152 | 482.23 | 3.19 | |

## ARITHMETIC RAW SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 165 | | | |
| Programs | 5 | 183.84 | 36.77 | 5.81* |
| 4 vs 1,2,3,5,6 | 1 | 69.26 | 69.26 | 10.95* |
| 1,2,3 vs 5,6 | 1 | .23 | .23 | .04 |
| 5 vs 6 | 1 | 70.45 | 70.45 | 11.14* |
| 1 vs 2,3 | 1 | 21.26 | 21.26 | 3.36 |
| 2 vs 3 | 1 | 7.13 | 7.13 | 1.23 |
| Participation vs Non-Part. | 1 | 2.21 | 2.21 | .35 |
| Program x Participation | 2 | 15.82 | 7.91 | 1.25 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 65.39 | 65.39 | 10.34* |
| 2 cells 3,6 vs 4,5 | 1 | 1.67 | 1.67 | .26 |
| 3 Class/Program | 8 | 104.07 | 13.01 | 2.06 |
| Pre-Score Effect | 1 | 3196.78 | 3196.78 | 505.30* |
| Error | 151 | 955.30 | 6.33 | |

## ARITHMETIC SCALED SCORE (WPPSI)

1-12

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 158 | | | |
| Programs | 5 | 245.63 | 49.13 | 9.99* |
| 4 vs 1,2,3,5,6 | 1 | 92.36 | 92.36 | 18.78* |
| 1,2,3 vs 5,6 | 1 | 67.90 | 67.90 | 13.81* |
| 5 vs 6 | 1 | 7.79 | 7.79 | 1.59 |
| 1 vs 2,3 | 1 | 54.62 | 54.62 | 11.11* |
| 2 vs 3 | 1 | 2.64 | 2.64 | .54 |
| Participation vs Non-Part. | 1 | 4.94 | 4.94 | 1.00 |
| Program x Participation | 2 | 41.07 | 20.53 | 4.18 |
| 1) cells 1,4,6 vs 2,3,5 | 1 | 73.30 | 73.30 | 14.91* |
| 2) cells 3,6 vs 4,5 | 1 | 2.68 | 2.68 | .54 |
| 3) Class/Program | 8 | 40.82 | 5.10 | 1.04 |
| Pre-Score Effect | 1 | 425.70 | 425.70 | 86.58* |
| Error | 151 | 742.44 | 4.92 | |

## SIMILARITIES RAW SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 238.42 | 47.68 | 5.32* |
| 4 vs 1,2,3,5,6 | 1 | 145.72 | 145.72 | 16.25* |
| 1,2,3 vs 5,6 | 1 | 37.06 | 37.06 | 4.13 |
| 5 vs 6 | 1 | 38.62 | 38.62 | 4.31 |
| 1 vs 2,3 | 1 | 12.12 | 12.12 | 1.35 |
| 2 vs 3 | 1 | 5.43 | 5.43 | .61 |
| Participation vs Non-Part. | 1 | 36.30 | 36.30 | 4.05 |
| Program x Participation | 2 | 17.89 | 8.94 | 1.00 |
| 1/ cells 1,4,6 vs 2,3,5 | 1 | 5.08 | 5.08 | .57 |
| 2/ cells 3,6 vs 4,5 | 1 | 3.08 | 3.08 | .34 |
| 3/ Class/Program | 8 | 92.56 | 11.60 | 1.29 |
| Pre-Score Effect | 1 | 938.70 | 938.70 | 104.67* |
| Error | 151 | 1354.24 | 8.97 | |

1-14

## SIMILARITIES SCALED SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 169.03 | 33.81 | 8.27* |
| 4 vs 1,2,3,5,6 | 1 | 88.14 | 88.14 | 21.58* |
| 1,2,3 vs 5,6 | 1 | 51.86 | 51.86 | 12.69* |
| 5 vs 6 | 1 | 19.91 | 19.91 | 4.87 |
| 1 vs 2,3 | 1 | 7.12 | 7.12 | 1.74 |
| 2 vs 3 | 1 | .93 | .93 | .23 |
| Participation vs Non-Part. | 1 | 1.18 | 1.18 | .29 |
| Program x Participation | 2 | 9.31 | 4.66 | 1.14 |
| 1/ cells 1,4,6 vs 2,3,5 | 1 | 38.62 | 38.62 | 9.45* |
| 2/ cells 3,6 vs 4,5 | 1 | .96 | .96 | .24 |
| 3/ Class/Program | 8 | 43.89 | 5.49 | 1.34 |
| Pre-Score Effect | 1 | 760.54 | 760.54 | 186.07* |
| Error | 151 | 617.18 | 4.09 | |

## COMPREHENSION RAW SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 146.99 | 29.40 | 3.00 |
| 4 vs 1,2,3,5,6 | 1 | 59.95 | 59.95 | 6.12 |
| 1,2,3 vs 5,6 | 1 | 3.73 | 3.73 | .38 |
| 5 vs 6 | 1 | 3.24 | 3.24 | .33 |
| 1 vs 2,3 | 1 | 80.91 | 80.91 | 8.25* |
| 2 vs 3 | 1 | 1.06 | 1.06 | .11 |
| Participation vs Non-Part. | 1 | 97.38 | 97.38 | 9.94* |
| Program x participation | 2 | 37.22 | 18.61 | 1.90 |
| 1) cells 1,4,6 vs 2,3,5 | 1 | 61.36 | 61.36 | 6.26 |
| 2) cells 3,6 vs 4,5 | 1 | 4.63 | 4.63 | .47 |
| 3) Class/Program | 8 | 527.49 | 65.94 | 6.73 |
| Pre-Score Effect | 1 | 933.05 | 933.05 | 95.19* |
| Error | 151 | 1480.07 | 9.80 | |

## COMPREHENSION SCALED SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 112.75 | 22.55 | 6.82* |
| 4 vs 1,2,3,5,6 | 1 | 25.28 | 25.28 | 7.65 |
| 1,2,3 vs 5,6 | 1 | 49.79 | 49.79 | 15.07* |
| 5 vs 6 | 1 | 18.98 | 18.98 | 5.75 |
| 1 vs 2,3 | 1 | 14.98 | 14.98 | 4.53 |
| 2 vs 3 | 1 | .89 | .89 | .27 |
| Participation vs Non-Part. | 1 | 33.60 | 33.60 | 10.17* |
| Program x Participation | 2 | 14.71 | 7.35 | 2.22 |
| 1) cells 1,4,6 vs 2,3,5 | 1 | 50.28 | 50.28 | 15.22* |
| 2) cells 3,6 vs 4,5 | 1 | .11 | .11 | .03 |
| 3) Class/Program | 8 | 138.14 | 17.27 | 5.22* |
| Pre-Score Effect | 1 | 372.44 | 372.44 | 112.71* |
| Error | 151 | 498.98 | 33.04 | |

## ANIMAL HOUSE RAW SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 3469.08 | 693.82 | 5.19* |
| 4 vs 1,2,3,5,6 | 1 | 1120.78 | 1120.78 | 8.39* |
| 1,2,3 vs 5,6 | 1 | 691.02 | 691.02 | 5.17 |
| 5 vs 6 | 1 | 10.42 | 10.42 | .08 |
| 1 vs 2,3 | 1 | 1973.63 | 1973.63 | 14.78* |
| 2 vs 3 | 1 | 100.49 | 100.49 | .75 |
| Participation vs Non-Part. | 1 | 29.27 | 29.27 | .22 |
| Program x Participation | 2 | 198.84 | 99.42 | .74 |
| 1) cells 1,4,6, vs 2,3,5 | 1 | 213.14 | 213.14 | 1.60 |
| 2) cells 3,6 vs 4,5 | 1 | 121.87 | 121.87 | .91 |
| 3) Class/Program | 8 | 777.30 | 97.16 | .73 |
| Pre-Score Effect | 1 | 2811.69 | 2811.69 | 21.04* |
| Error | 151 | 20178.53 | 113.63 | |

## ANIMAL HOUSE SCALED SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 123.76 | 24.75 | 4.92* |
| 4 vs 1,2,3,5,6 | 1 | 58.16 | 58.16 | 11.55* |
| 1,2,3 vs 5,6 | 1 | 4.58 | 4.58 | .91 |
| 5 vs 6 | 1 | 7.67 | 7.67 | 1.52 |
| 1 vs 2,3 | 1 | 43.99 | 43.99 | 8.74* |
| 2 vs 3 | 1 | 6.83 | 6.83 | 1.36 |
| Participation vs Non-Part. | 1 | 0.00 | 0.00 | 0.00 |
| Program x Participation | 2 | 5.44 | 2.72 | 0.54 |
| 1) cells 1,4,6 vs 2,3,5 | 1 | 23.03 | 23.03 | 4.58 |
| 2) cells 3,6 vs 4,5 | 1 | .52 | .52 | .10 |
| 3) Class/Program | 8 | 26.56 | 3.32 | .66 |
| Pre-Score Effect | 1 | 221.54 | 221.54 | 44.01* |
| Error | 151 | 760.14 | 5.034 | |

## ERRORS AND OMISSIONS: ANIMAL HOUSE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 333.67 | 66.73 | 5.34* |
| 4 vs 1,2,3,5,6 | 1 | 117.24 | 117.24 | 9.39* |
| 1,2,3 vs 5,6 | 1 | 45.66 | 45.66 | 3.66 |
| 5 vs 6 | 1 | 13.56 | 13.56 | 1.09 |
| 1 vs 2,3 | 1 | 194.94 | 194.94 | 15.61* |
| 2 vs 3 | 1 | .05 | .05 | .00 |
| Participation vs Non-Part. | 1 | .82 | .82 | .07 |
| Program x Participation | 2 | 3.11 | 1.56 | 0.12 |
| [1] cells 1,4,6 vs 2,3,5 | 1 | 32.09 | 32.09 | 2.57 |
| [2] cells 3,6 vs 4,5 | 1 | 4.63 | 4.63 | .37 |
| [3] Class/Program | 8 | 90.04 | 11.26 | .90 |
| Pre-Score Effect | 1 | 1966.09 | 1966.09 | 157.44* |
| Error | 151 | 1885.67 | 12.49 | |

TIME IN SECONDS: ANIMAL HOUSE (WPPSI)

## Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 26246.96 | 5249.39 | 2.17 |
| 4 vs 1,2,3,5,6 | 1 | 2074.08 | 2074.08 | .86 |
| 1,2,3 vs 5,6 | 1 | 123.57 | 123.57 | .05 |
| 5 vs 6 | 1 | 3823.49 | 3823.49 | 1.58 |
| 1 vs 2,3 | 1 | 14436.20 | 14436.20 | 5.96 |
| 2 vs 3 | 1 | 6118.06 | 6118.06 | 2.53 |
| Participation vs Non-Part. | 1 | 101.77 | 101.77 | .42 |
| Program x Participation | 2 | 3880.66 | 1940.33 | .80 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 3006.94 | 3006.94 | 1.24 |
| 2 cells 3,6 vs 4,5 | 1 | 3816.22 | 3816.22 | 1.58 |
| 3 Class/Program | 8 | 25634.41 | 3204.30 | 1.32 |
| Pre-Score Effect | 1 | 188274.64 | 188274.64 | 77.70* |
| Error | 151 | 365872.21 | 2422.99 | |

## PICTURE COMPLETION RAW SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 378.32 | 75.66 | 6.17* |
| 4 vs 1,2,3,5,6 | 1 | 253.01 | 253.01 | 20.64* |
| 1,2,3 vs 5,6 | 1 | 16.81 | 16.81 | 1.37 |
| 5 vs 6 | 1 | 13.46 | 13.46 | 1.10 |
| 1 vs 2,3 | 1 | 75.76 | 75.76 | 6.18 |
| 2 vs 3 | 1 | .54 | .54 | .04 |
| Participation vs Non-Part. | 1 | .64 | .64 | .05 |
| Program x Participation | 2 | 14.84 | 7.42 | 0.61 |
| 1) cells 1,4,6 vs 2,3,5 | 1 | 37.07 | 37.07 | 3.02 |
| 2) cells 3,6 vs 4,5 | 1 | 2.16 | 2.16 | .18 |
| 3) Class/Program | 8 | 146.04 | 18.26 | 1.49 |
| Pre-Score Effect | 1 | 408.13 | 408.13 | 33.29* |
| Error | 151 | 1851.17 | 12.26 | |

## PICTURE COMPLETION SCALED SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 238.50 | 47.70 | 8.76* |
| 4 vs 1,2,3,5,6 | 1 | 137.91 | 137.91 | 25.34* |
| 1,2,3 vs 5,6 | 1 | 51.09 | 51.09 | 9.39* |
| 5 vs 6 | 1 | .67 | .67 | .12 |
| 1 vs 2,3 | 1 | 30.75 | 30.75 | 5.65 |
| 2 vs 3 | 1 | 1.78 | 1.78 | .33 |
| Participation vs Non-Part. | 1 | .00 | .00 | .00 |
| Program x Participation | 2 | 11.76 | 5.88 | 1.08 |
| 1) cells 1,4,6 vs 2,3,5 | 1 | 37.98 | 37.98 | 6.98* |
| 2) cells 3,6 vs 4,5 | 1 | .11 | .11 | .02 |
| 3) Class/Program | 8 | 50.93 | 6.37 | 1.17 |
| Pre-Score Effect | 1 | 288.18 | 288.18 | 52.95* |
| Error | 151 | 821.79 | 5.44 | |

## MAZES RAW SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 150.06 | 30.01 | 1.84 |
| 4 vs 1,2,3,5,6 | 1 | 1.40 | 1.40 | .09 |
| 1,2,3 vs 5,6 | 1 | 23.74 | 23.74 | 1.45 |
| 5 vs 6 | 1 | 13.44 | 13.44 | .82 |
| 1 vs 2,3 | 1 | 4.10 | 4.10 | .25 |
| 2 vs 3 | 1 | 91.86 | 91.86 | 5.63 |
| Participation vs Non-Part. | 1 | 19.58 | 19.58 | 1.20 |
| Program x Participation | 2 | 70.27 | 35.13 | 2.15 |
| 1) cells 1,4,6 vs 2,3,5 | 1 | 77.10 | 77.10 | 4.72 |
| 2) cells 3,6 vs 4,5 | 1 | 49.15 | 49.15 | 3.01 |
| 3) Class/Program | 8 | 308.12 | 39.52 | 2.42 |
| Pre-Score Effect | 1 | 82.58 | 82.58 | 5.06 |
| Error | 151 | 2465.57 | 16.33 | |

## MAZED SCALED SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 60.62 | 12.12 | 1.83 |
| 4 vs 1,2,3,5,6 | 1 | .21 | .21 | .03 |
| 1,2,3 vs 5,6 | 1 | 35.80 | 35.80 | 5.41 |
| 5 vs 6 | 1 | .19 | .19 | .03 |
| 1 vs 2,3 | 1 | 4.11 | 4.11 | .62 |
| 2 vs 3 | 1 | 14.74 | 14.74 | 2.23 |
| Participation vs Non-Part. | 1 | 7.00 | 7.00 | 1.06 |
| Program x Participation | 2 | 27.77 | 13.89 | 2.10 |
| 1) cells 1,4,6 vs 2,3,5 | 1 | 51.00 | 51.00 | 7.70 |
| 2) cells 3,6 vs 4,5 | 1 | 10.48 | 10.48 | 1.58 |
| 3) Class/Program | 8 | 89.72 | 11.21 | 1.69 |
| Pre-Score Effect | 1 | 146.31 | 146.31 | 22.10* |
| Error | 151 | 1000.08 | 6.623 | |

## GEOMETRIC DESIGN RAW SCORE (WPPSI)

1-25

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 865.68 | 173.14 | 5.76* |
| 4 vs 1,2,3,5,6 | 1 | 61.41 | 61.41 | 2.04 |
| 1,2,3 vs 5,6 | 1 | 297.05 | 297.05 | 9.88* |
| 5 vs 6 | 1 | 9.23 | 9.23 | .31 |
| 1 vs 2,3 | 1 | 617.38 | 617.38 | 20.53* |
| 2,vs 3 | 1 | 2.77 | 2.77 | .09 |
| Participation vs Non-Part. | 1 | 4.30 | 4.30 | .14 |
| Program x Participation | 2 | 67.02 | 33.51 | 1.11 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 135.81 | 135.81 | 4.52 |
| 2 cells 3,6 vs 4,5 | 1 | 17.65 | 17.65 | .59 |
| 3 Class/Program | 8 | 886.40 | 110.80 | 3.68* |
| Pre-Score Effect | 1 | 5540.43 | 5540.43 | 184.24* |
| Error | 151 | 4540.82 | 30.072 | |

## GEOMETRIC DESIGN SCALED SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 169 | | | |
| Programs | 5 | 221.09 | 44.22 | 8.14* |
| 4 vs 1,2,3,5,6 | 1 | 20.66 | 42.25 | 3.80 |
| 1,2,3 vs 5,6 | 1 | .47 | 38.51 | .47 |
| 5 vs 6 | 1 | 9.75 | 14.60 | 9.75* |
| 1 vs 2,3 | 1 | 106.40 | 9.90 | 19.58* |
| 2 vs 3 | 1 | 39.91 | 19.29 | 7.34* |
| Participation vs Non-Part. | 1 | 5.63 | 5.63 | 1.04 |
| Program x Participation | 2 | 29.25 | 14.63 | 2.69 |
| 1) cells 1,4,6 vs 2,3,5 | 1 | 58.28 | 58.28 | 10.73* |
| 2) cells 3,6 vs 4,5 | 1 | 3.71 | 3.71 | .682 |
| 3) Class/Program | 8 | 150.92 | 18.87 | 3.47* |
| Pre-Score Effect | 1 | 356.46 | 356.46 | 65.60* |
| Error | 151 | 820.49 | 5.433 | |

## BLOCK DESIGN RAW SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 280.12 | 56.02 | 3.31* |
| 4 vs 1,2,3,5,6 | 1 | 29.38 | 29.38 | 1.74 |
| 1,2,3 vs 5,6 | 1 | 3.90 | 3.90 | .23 |
| 5 vs 6 | 1 | 88.92 | 88.92 | 5.26 |
| 1 vs 2,3 | 1 | 133.72 | 133.72 | 7.91* |
| 2 vs 3 | 1 | 24.07 | 24.07 | 1.42 |
| Participation vs Non-Part. | 1 | 7.69 | | |
| Program x Participation | 2 | 13.31 | 6.66 | 0.39 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 28.98 | 28.98 | 1.71 |
| 2 cells 3,6 vs 4,5 | 1 | .00 | .00 | .00 |
| 3 Class/Program | 8 | 144.33 | 18.04 | 1.07 |
| Pre-Score Effect | 1 | 619.94 | 619.94 | 36.66* |
| Error | 151 | 2553.58 | 16.91 | |

## BLOCK DESIGN SCALED SCORE (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 114.69 | 22.94 | 4.27* |
| 4 vs 1,2,3,5,6 | 1 | 15.22 | 15.22 | 1.37 |
| 1,2,3 vs 5,6 | 1 | 63.90 | 63.90 | 11.90* |
| 5 vs 6 | 1 | 3.29 | 3.29 | .53 |
| 1 vs 2,3 | 1 | 15.31 | 15.31 | 2.85 |
| 2 vs 3 | 1 | .01 | .01 | .00 |
| Participation vs Non-Part. | 1 | 16.13 | 16.13 | 3.00 |
| Program x Participation | 2 | 18.08 | 9.04 | 1.68 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 56.08 | 56.08 | 10.44* |
| 2 cells 3,6 vs 4,5 | 1 | .70 | .70 | .13 |
| 3 Class/Program | 8 | 116.65 | 14.58 | 2.72* |
| Pre-Score Effect | 1 | 497.44 | 497.44 | 92.60* |
| Error | 151 | 811.15 | 5.37 | |

SUM OF RAW SCORES: TOTAL (WPPSI) 1-29

## Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 1310.62 | 262.12 | 6.32* |
| 4 vs 1,2,3,5,6 | 1 | 6.11 | 6.11 | .15 |
| 1,2,3 vs 5,6 | 1 | 95.79 | 95.79 | 2.31 |
| 5 vs 6 | 1 | 320.20 | 320.20 | 7.72* |
| 1 vs 2,3 | 1 | 936.25 | 936.25 | 22.58* |
| 2 vs 3 | 1 | 25.10 | 25.10 | .61 |
| Participation vs Non-Part. | 1 | .15 | .15 | .00 |
| Program x Participation | 2 | 121.93 | 60.96 | 1.47 |
| [1] cells 1,4,6 vs 2,3,5 | 1 | 18.28 | 18.28 | .44 |
| [2] cells 3,6 vs 4,5 | 1 | .64 | .64 | .02 |
| [3] Class/Program | 8 | 927.90 | 115.99 | 2.80* |
| Pre-Score Effect | 1 | 1089.56 | 1089.56 | 26.28* |
| Error | 151 | 6260.61 | 41.46 | |

## SUM OF RAW SCORES: PRORATED (WPPSI)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 22238.68 | 4447.74 | 4.60* |
| 4 vs 1,2,3,5,6 | 1 | 255.33 | 255.33 | .26 |
| 1,2,3 vs 5,6 | 1 | 3551.57 | 3551.57 | 3.68 |
| 5 vs 6 | 1 | 3916.19 | 3916.19 | 4.05 |
| 1 vs 2,3 | 1 | 15540.52 | 15540.52 | 16.08* |
| 2 vs 3 | 1 | 793.29 | 793.29 | .82 |
| Participation vs Non-Part. | 1 | 89.90 | 89.90 | .09 |
| Program x Participation | 2 | 3597.43 | 1798.71 | 1.86 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 200.96 | 200.96 | .21 |
| 2 cells 3,6 vs 4,5 | 1 | 123.86 | 123.86 | .13 |
| 3 Class/Program | 8 | 29095.60 | 3636.95 | 3.76* |
| Pre-Score Effect | 1 | 19947.95 | 19947.95 | 20.64* |
| Error | 151 | 145933.01 | 966.44 | |

## PSYCHOLINGUISTIC AGE* (ITPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 2833.68 | 566.74 | .48 |
| 4 vs 1,2,3,5,6 | 1 | 17.35 | 17.35 | .50 |
| 1,2,3, vs 5,6 | 1 | 3313.85 | 3313.85 | 1.63 |
| 5 vs 6 | 1 | 76.60 | 76.60 | .04 |
| 1 vs 2,3 | 1 | 500.69 | 500.69 | .25 |
| 2 vs 3 | 1 | 338.81 | 338.81 | .17 |
| Participation vs Non-Part. | 1 | 3831.24 | 3831.24 | 1.88 |
| Program x Participation | 2 | 5960.57 | 2980.28 | 2.50 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 1279.91 | 1279.91 | .63 |
| 2 cells 3,6 vs 4,5 | 1 | 1395.38 | 1395.38 | .69 |
| 3 Class/Program | 8 | 16282.51 | 2035.31 | 8.00* |
| Pre-Score Effect | 1 | 144.45 | 144.45 | .12 |
| Error | 151 | 180053.46 | 1192.41 | |

*Prorated sum of raw scores

## AUDITORY ASSOCIATION-RAW SCORE (ITPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 519.76 | 103.95 | 9.90* |
| 4 vs 1,2,3,5,6 | 1 | 31.20 | 31.20 | 2.97 |
| 1,2,3 vs 5,6 | 1 | 91.65 | 91.65 | 8.73* |
| 5 vs 6 | 1 | 211.13 | 211.13 | 20.12* |
| 1 vs 2,3 | 1 | 155.34 | 155.34 | 14.80* |
| 2 vs 3 | 1 | 71.23 | 71.23 | 6.79 |
| Participation vs Non-Part. | 1 | 26.14 | 26.14 | 2.49 |
| Program x participation | 2 | 8.68 | 4.34 | .41 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 1.52 | 1.52 | .15 |
| 2 cells 3,6 vs 4,5 | 1 | 2.71 | 2.71 | .26 |
| 3 Class/Program | 8 | 287.79 | 35.97 | 3.43* |
| Pre-Score Effect | 1 | 170.51 | 170.51 | 16.25* |
| Error | 151 | 1584.85 | 10.50 | |

## LANGUAGE AGE SCORE (ITPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 8411.11 | 1682.22 | .70 |
| 4 vs 1,2,3,5,6 | 1 | 1203.75 | 1203.75 | .50 |
| 1,2,3 vs 5,6 | 1 | 4774.40 | 4774.40 | 1.99 |
| 5 vs 6 | 1 | 370.69 | 370.69 | .16 |
| 1 vs 2,3 | 1 | 56.63 | 56.63 | .02 |
| 2 vs 3 | 1 | 2182.41 | 2182.41 | .91 |
| Participation vs Non-Part. | 1 | 6136.03 | 6136.03 | 2.57 |
| Program x Participation | 2 | 7464.34 | 3732.17 | 1.56 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 836.88 | 836.88 | .35 |
| 2 cells 3,6 vs 4,5 | | 1423.16 | 1423.16 | .60 |
| 3 Class/Program | 8 | 41485.47 | 5185.68 | 8.00* |
| Pre-Score Effect | 1 | 6561.68 | 6561.68 | 2.75 |
| Error | 151 | 360576.19 | 2387.92 | |

## SCALED SCORE (ITPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 482.26 | 96.45 | 2.72 |
| 4 *vs* 1,2,3,5,6 | 1 | 52.89 | 52.89 | 1.49 |
| 1,2,3 *vs* 5,6 | 1 | 3.96 | 3.96 | .12 |
| 5 *vs* 6 | 1 | 208.61 | 208.61 | 5.88 |
| 1 *vs* 2,3 | 1 | 143.03 | 143.03 | 4.03 |
| 2 *vs* 3 | 1 | 58.99 | 58.99 | 2.77 |
| Participation vs Non-Part. | 1 | 48.06 | 48.06 | 1.36 |
| Program x Participation | 2 | 6.41 | 3.20 | .09 |
| 1 cells 1,4,6 *vs* 2,3,5 | 1 | 1.27 | 1.27 | .04 |
| 2 cells 3,6 *vs* 4,5 | 1 | 12.10 | 12.10 | .34 |
| 3 Class/Program | 8 | 950.51 | 118.81 | 3.34* |
| Pre-Score Effect | 1 | 1121.88 | 1121.88 | 31.63* |
| Error | 151 | 5356.58 | 35.47 | |

## VERBAL EXPRESSION-RAW SCORE (ITPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 202.28 | 40.46 | 1.92 |
| 4 vs 1,2,3,5,6 | 1 | 1113.60 | 1113.60 | .35 |
| 1,2,3 vs 5,6 | 1 | 1106.08 | 1106.08 | .35 |
| 5 vs 6 | 1 | 6335.10 | 6335.10 | 1.99 |
| 1 vs 2,3 | 1 | 20354.86 | 20354.86 | 6.41 |
| 2 vs 3 | 1 | 3082.88 | 3082.88 | .97 |
| Participation vs Non-Part. | 1 | 2231.37 | 2231.37 | .70 |
| Program x Participation | 2 | 74.90 | 37.45 | 1.78 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 6407.09 | 6407.09 | 2.02 |
| 2 cells 3,6 vs 4,5 | 1 | 468.54 | 468.54 | .15 |
| 3 Class/Program | 8 | 826.65 | 103.33 | 4.91* |
| Pre-Score Effect | 1 | 915.45 | 915.45 | 43.50* |
| Error | 151 | 3177.49 | 21.04 | |

## VERBAL EXPRESSION LANGUAGE AGE SCORE (I TPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 2588.17 | 517.63 | .39 |
| 4 vs 1,2,3,5,6 | 1 | 100.60 | 100.63 | .08 |
| 1,2,3 vs 5,6 | 1 | 363.27 | 363.27 | 1.03 |
| 5 vs 6 | 1 | 79.27 | 79.27 | .82 |
| 1 vs 2,3 | 1 | 317.09 | 317.09 | .24 |
| 2 vs 3 | 1 | 154.47 | 154.47 | .12 |
| Participation vs Non-Part. | 1 | 981.32 | 981.32 | .74 |
| Program x Participation | 2 | 7969.21 | 3984.61 | 3.02 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 1917.64 | 1917.64 | 1.45 |
| 2 cells 3,6 vs 4,5 | 1 | 1265.78 | 1265.78 | .96 |
| 3 Class/Program | 8 | 7969.21 | 3984.61 | 3.01 |
| Pre-Score Effect | 1 | 14258.15 | 14258.15 | 10.80* |
| Error | 151 | 199420.97 | 1320.67 | |

## VERBAL EXPRESSION SCALED SCORE (ITPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 172.93 | 34.59 | 1.23 |
| 4 vs 1,2,3,5,6 | 1 | 33.24 | 33.24 | 1.40 |
| 1,2,3 vs 5,6 | 1 | 54.74 | 54.74 | 1.95 |
| 5 vs 6 | 1 | .31 | .31 | .00 |
| 1 vs 2,3 | 1 | 40.61 | 40.61 | 2.10 |
| 2 vs 3 | 1 | 15.62 | 15.62 | .31 |
| Participation vs Non-Part. | 1 | 40.86 | 40.86 | 1.46 |
| Program x Participation | 2 | 7.95 | 3.98 | .14 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 18.45 | 18.45 | .66 |
| 2 cells 3,6 vs 4,5 | 1 | .94 | .94 | .03 |
| 3 Class/Program | 8 | 919.08 | 114.89 | 4.09* |
| Pre-Score Effect | 1 | 1511.84 | 1511.84 | 53.90* |
| Error | 151 | 4235.20 | 28.05 | |

## LABELS (ITPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 7.13 | 1.42 | 1.42 |
| 4 *vs* 1,2,3,5,6 | 1 | 4.15 | 4.15 | 4.14 |
| 1,2,3 *vs* 5,6 | 1 | .15 | .15 | .12 |
| 5 *vs* 6 | 1 | .07 | .07 | .07 |
| 1 *vs* 2,3 | 1 | 1.69 | 1.69 | 1.69 |
| 2 *vs* 3 | 1 | 1.15 | 1.15 | 1.15 |
| Participation vs Non-Part. | 1 | 1.54 | 1.54 | 1.54 |
| Program x Participation | 2 | 1.02 | .51 | .51 |
| [1] cells 1,4,6 *vs* 2,3,5 | 1 | 23.03 | 23.03 | 22.98* |
| [2] cells 3,6 *vs* 4,5 | 1 | 18.14 | 18.14 | 18.11* |
| [3] Class/Program | 8 | 12.72 | 1.59 | 1.59 |
| Pre-Score Effect | 1 | 122.17 | 122.17 | 121.95* |
| Error | 151 | 151.34 | 1.00 | |

## COLOR (ITPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 18.79 | 3.76 | 2.57 |
| 4 vs 1,2,3,5,6 | 1 | .00 | .00 | .00 |
| 1,2,3, vs 5,6 | 1 | 5.90 | 5.90 | 4.03 |
| 5 vs 6 | 1 | 4.00 | 4.00 | 2.73 |
| 1 vs 2,3 | 1 | .52 | .52 | .36 |
| 2 vs 3 | 1 | 5.62 | 5.62 | 3.84 |
| Participation vs Non-Part. | 1 | .08 | .08 | .05 |
| Program x Participation | 2 | 2.19 | 1.10 | .75 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | .23 | .23 | .16 |
| 2 cells 3,6 vs 4,5 | 1 | 22.78 | 22.78 | 15.56* |
| 3 Class/Program | 8 | 28.00 | 3.50 | 2.39 |
| Pre-Score Effect | 1 | 266.52 | 266.52 | 182.11* |
| Error | 151 | 220.89 | 1.46 | |

## SHAPE (ITPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 20.53 | 4.10 | 4.35 |
| 4 vs 1,2,3,5,6 | 1 | 3.79 | 3.79 | 4.02 |
| 1,2,3 vs 5,6 | 1 | 8.37 | 8.37 | 8.87* |
| 5 vs 6 | 1 | 1.82 | 1.82 | 1.93 |
| 1 vs 2,3 | 1 | 6.56 | 6.56 | 6.96* |
| 2 vs 3 | 1 | 1.75 | 1.75 | 1.86 |
| Participation vs Non-Part. | 1 | 4.04 | 4.04 | 4.28 |
| Program x Participation | 2 | .04 | .02 | .02 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 7.38 | 7.38 | 7.83* |
| 2 cells 3,6 vs 4,5 | 1 | 9.75 | 9.75 | 10.34* |
| 3 Class/Program | 8 | 29.90 | 29.90 | 31.80* |
| Pre-Score Effect | 1 | 33.97 | 33.97 | 36.03* |
| Error | 151 | 142.35 | 0.94 | |

## COMPOSITION (ITPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 3.73 | .74 | 1.52 |
| 4 vs 1,2,3,5,6 | 1 | 1.61 | 1.61 | 3.29 |
| 1,2,3 vs 5,6 | 1 | 1.82 | 1.82 | 3.72 |
| 5 vs 6 | 1 | .58 | .58 | 1.75 |
| 1 vs 2,3 | 1 | .11 | .11 | .23 |
| 2 vs 3 | 1 | .13 | .13 | .27 |
| Participation vs Non-Part. | 1 | 3.05 | 3.05 | 6.23 |
| Program x Participation | 2 | .72 | .36 | .73 |
| 1/ cells 1,4,6 vs 2,3,5 | 1 | 7.44 | 7.44 | 15.19* |
| 2/ cells 3,6 vs 4,5 | 1 | 15.96 | 15.96 | 32.58* |
| 3/ Class/Program | 8 | 3.48 | .43 | .87 |
| Pre-Score Effect | 1 | 37.85 | 37.85 | 77.26* |
| Error | 151 | 73.98 | 0.49 | |

## FUNCTIONS (ITPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 57.29 | 11.46 | 1.37 |
| 4 *vs* 1,2,3,5,6 | 1 | .64 | .64 | .08 |
| 1,2,3 *vs* 5,6 | 1 | 1.01 | 1.01 | .12 |
| 5 *vs* 6 | 1 | 15.03 | 15.03 | 1.80 |
| 1 *vs* 2,3 | 1 | 42.04 | 42.04 | 5.02 |
| 2 *vs* 3 | 1 | .42 | .42 | .05 |
| Participation vs Non-Part. | 1 | 12.66 | 12.66 | 1.51 |
| Program x Participation | 2 | 27.43 | 13.71 | 1.64 |
| 1 cells 1,4,6 *vs* 2,3,5 | 1 | 3.56 | 3.56 | .42 |
| 2 cells 3,6 *vs* 4,5 | 1 | 21.94 | 21.94 | 2.62 |
| 3 Class/Program | 8 | 141.27 | 17.66 | 2.10 |
| Pre-Score Effect | 1 | 491.10 | 491.10 | 58.66* |
| Error | 151 | 1264.23 | 8.37 | |

## MAJOR PARTS (ITPA)

## Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 163 | | | |
| Programs | 5 | 11.71 | 2.34 | 2.16 |
| 4 vs 1,2,3,5,6 | 1 | 8.09 | 8.09 | 7.45* |
| 1,2,3 vs 5,6 | 1 | 1.89 | 1.89 | 1.74 |
| 5 vs 6 | 1 | .24 | .24 | .22 |
| 1 vs 2,3 | 1 | .33 | .33 | .30 |
| 2 vs 3 | 1 | .03 | .03 | .03 |
| Participation vs NOn-Part. | 1 | .01 | .01 | .01 |
| Program x Participation | 2 | 4.44 | 2.22 | 2.05 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 41.24 | 41.24 | 37.97* |
| 2 cells 3,6 vs 4,5 | 1 | 17.12 | 17.12 | 15.76* |
| 3 Class/Program | 8 | 6.28 | .79 | .73 |
| Pre-Score Effect | 1 | 2304.58 | 2304.58 | 2122.64* |
| Error | 151 | 163.94 | 1.08 | |

## NUMEROSITY (ITPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 1.55 | .31 | 1.11 |
| 4 vs 1,2,3,5,6 | 1 | .14 | .14 | .51 |
| 1,2,3, vs 5,6 | 1 | .00 | .00 | .00 |
| 5 vs 6 | 1 | .04 | .04 | .14 |
| 1 vs 2,3 | 1 | .95 | .95 | 3.42 |
| 2 vs 3 | 1 | .10 | .10 | .36 |
| Participation vs Non-Part. | 1 | .22 | .22 | .80 |
| Program x Participation | 2 | 1.95 | .97 | 3.50 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 32.44 | 32.44 | 116.68* |
| 2 cells 3,6 vs 4,5 | 1 | 13.21 | 13.21 | 47.51* |
| 3 Class/Program | 8 | 2.05 | .26 | .92 |
| Pre-Score Effect | 1 | 143.88 | 143.88 | 517.27* |
| Error | 151 | 42.00 | 0.28 | |

COMPARISON (ITPA)

## Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 2.72 | .54 | 1.83 |
| 4 vs 1,2,3,5,6 | 1 | .04 | .04 | .14 |
| 1,2,3 vs 5,6 | 1 | 1.63 | 1.63 | 5.48 |
| 5 vs 6 | 1 | .17 | .17 | .58 |
| 1 vs 2,3 | 1 | .37 | .37 | 1.26 |
| 2 vs 3 | 1 | .43 | .43 | 1.45 |
| Participation vs Non-Part. | 1 | .32 | .32 | 1.07 |
| Program x Participation | 2 | .59 | .30 | .99 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | .01 | .01 | .03 |
| 2 cells 3,6 vs 4,5 | 1 | 1.61 | 1.61 | 5.43 |
| 3 Class/Program | 8 | 1.87 | .23 | .76 |
| Pre-Score Effect | 1 | 26.65 | 26.65 | 89.63* |
| Error | 151 | 44.89 | 0.30 | |

## OTHER CHARACTERISTICS (ITPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 1.85 | .37 | 1.09 |
| 4 vs 1,2,3,5,6 | 1 | .44 | .44 | 1.31 |
| 1,2,3 vs 5,6 | 1 | .30 | .30 | .89 |
| 5 vs 6 | 1 | .00 | .00 | .00 |
| 1 vs 2,3 | 1 | .83 | .83 | 2.45 |
| 2 vs 3 | 1 | .27 | .27 | .81 |
| Participation vs Non-Part. | 1 | .23 | .23 | .69 |
| Program x Participation | 2 | 1.88 | .94 | 2.78 |
| [1] cells 1,4,6 vs 2,3,5 | 1 | 18.52 | 18.52 | 54.63* |
| [2] cells 3,6 vs 4,5 | 1 | 5.68 | 5.68 | 16.76* |
| [3] Class/Program | 8 | 2.67 | .33 | .97 |
| Pre-Score Effect | 1 | 20.87 | 20.87 | 61.67* |
| Error | 151 | 51.11 | 0.34 | |

## PERSON, PLACE OR THING (ITPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 48.83 | 9.76 | 2.76 |
| 4 vs 1,2,3,5,6 | 1 | 5.79 | 5.79 | 1.64 |
| 1,2,3 vs 5,6 | 1 | 8.24 | 8.24 | 2.33 |
| 5 vs 6 | 1 | 30.34 | 30.34 | 8.58* |
| 1 vs 2,3 | 1 | .83 | .83 | .23 |
| 2 vs 3 | 1 | .24 | .24 | .07 |
| Participation vs Non-Part. | 1 | 4.51 | 4.51 | 1.27 |
| Program x Participation | 2 | 3.65 | 1.83 | .52 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 5.26 | 5.26 | 1.49 |
| 2 cells 3,6 vs 4,5 | 1 | 11.90 | 11.90 | 3.36 |
| 3 Class/Program | 8 | 32.04 | 4.00 | 1.12 |
| Pre-Score Effect | 1 | 155.56 | 155.56 | 43.98* |
| Error | 151 | 534.03 | 3.54 | |

## NUMBER OF DIFFERENT CATEGORIES OF CREDITED RESPONSES (ITPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 18.58 | 3.71 | 1.43 |
| 4 vs 1,2,3,5,6 | 1 | 1.75 | 1.75 | .67 |
| 1,2,3 vs 5,6 | 1 | 7.89 | 7.89 | 3.04 |
| 5 vs 6 | 1 | 4.92 | 4.92 | 1.90 |
| 1 vs 2,3 | 1 | .32 | .32 | .12 |
| 2 vs 3 | 1 | 5.41 | 5.41 | 2.08 |
| Participation vs Non-Part. | 1 | 9.54 | 9.54 | 3.67 |
| Program x Participation | 2 | .10 | .05 | .02 |
| 1 cells 1,4,6 vs 2,3,5 | 1 | 15.57 | 15.57 | .99 |
| 2 cells 3,6 vs 4,5 | 1 | 14.42 | 14.42 | 5.55 |
| 3 Class/Program | 8 | 43.38 | 5.42 | 2.09 |
| Pre-Score Effect | 1 | 183.81 | 183.81 | 70.81* |
| Error | 151 | 391.97 | 2.59 | |

## CHRONOLOGICAL AGE IN MONTHS: AT TIME OF TESTING (ITPA)

### Analysis of Variance Table

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | F |
|---|---|---|---|---|
| Total | 168 | | | |
| Programs | 5 | 32.02 | 6.40 | .78 |
| 4 *vs* 1,2,3,5,6 | 1 | .00 | .00 | .00 |
| 1,2,3 *vs* 5,6 | 1 | 1.38 | 1.38 | .17 |
| 5 *vs* 6 | 1 | 16.69 | 16.69 | 2.04 |
| 1 *vs* 2,3 | 1 | 3.95 | 3.95 | .48 |
| 2 *vs* 3 | 1 | 2.46 | 2.46 | .30 |
| Participation vs Non-Part. | 1 | 4.78 | 4.78 | .58 |
| Program x Participation | 2 | .27 | .14 | .02 |
| 1 cells 1,4,6 *vs* 2,3,5 | 1 | 1.01 | 1.01 | .12 |
| 2 cells 3,6 *vs* 4,5 | 1 | .10 | .10 | .01 |
| 3 Class/Program | 8 | 49.64 | 6.20 | .75 |
| Pre-Score Effect | 1 | 89.42 | 89.42 | 10.92* |
| Error | 151 | 1236.21 | 8.19 | |

# APPENDIX II

## MEANS AND t-TESTS FOR THE INTERVENTION

TABLES 1 - 49

VERBAL SCALED SCORE (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 6.38 | 8.99 | 5.07 | | | | 7.72 |
| Non-Participating Parents | 6.13 | 4.16 | 5.20 | -1.33 | 9.47 | 15.29 | 6.07 |
| Program Means | 6.25 | 6.57 | 5.13 | -1.33 | 9.47 | 15.29 | 6.90 |

4 vs 1.2.3.5.6 t = -6.50

1,2,3, vs 5,6 t = -5.10

5 vs 6 t = -3.27

1 vs 2,3 t = .26

2 vs 3 t = .67

Participation vs Non-Participation t = .98

Interaction 1 t = 1.65

Interaction 2 t = 1.00

## VERBAL IQ (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 8.63 | 11.49 | 7.22 | | | | 10.66 |
| Non-Participating Parents | 7.92 | 4.99 | 8.62 | -1.58 | 11.79 | 19.87 | -8.12 |
| Program Means | 8.28 | 8.24 | 7.92 | -1.58 | 11.79 | 19.87 | 9.09 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -6.59 |
| 1,2,3 vs 5,6 | t = -4.79 |
| 5 vs 6 | t = -3.54 |
| 1 vs 2,3 | t = .10 |
| 2 vs 3 | t = .12 |
| Participation vs Non-Participation | t = .90 |
| Interaction 1 | t = 1.78 |
| Interaction 2 | t = 1.20 |

PERFORMANCE SCALED SCORE (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | -2.11 | 11.04 | 4.15 | | | | 4.78 |
| Non-Participating Parents | 0.58 | 5.07 | 5.78 | -1.75 | 6.64 | 9.88 | 4.23 |
| Program Means | -0.77 | 8.05 | 4.97 | -1.75 | 6.64 | 9.88 | 4.50 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -4.43 |
| 1,2,3, vs 5,6 | t = -3.02 |
| 5 vs 6 | t = -1.66 |
| 1 vs 2,3 | t = -4.30 |
| 2 vs 3 | t = 1.30 |
| Participation vs Non-Participation | t = .29 |
| Interaction 1 | t = -2.24 |
| Interaction 2 | t = 1.80 |

## PERFORMANCE IQ (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | -2.54 | 15.34 | 5.20 | | | | 6.84 |
| Non-Participating Parents | 0.73 | 6.45 | 7.88 | -2.18 | 9.31 | 14.44 | 5.86 |
| Program Means | -0.90 | 10.90 | 6.54 | -2.18 | 9.31 | 14.44 | 6.35 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -4.39 |
| 1,2,3 vs 5,6 | t = -3.34 |
| 5 vs 6 | t = -1.90 |
| 1 vs 2,3 | t = -4.13 |
| 2 vs 3 | t = 1.33 |
| Participation vs Non-Participation | t = .38 |
| Interaction 1 | t = -2.31 |
| Interaction 2 | t = 1.96 |

## FULL SCALE SCORE (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 4.02 | 20.44 | 9.86 | | | | 12.18 |
| Non-Participating Parents | 6.96 | 10.10 | 12.89 | -3.50 | 15.16 | 24.92 | 10.72 |
| Program Means | 5.49 | 15.27 | 11.38 | -3.50 | 15.16 | 24.92 | 11.45 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -6.43 |
| 1,2,3, vs 5,6 | t = -4.06 |
| 5 vs 6 | t = -3.02 |
| 1 vs 2,3 | t = -2.79 |
| 2 vs 3 | t = .99 |
| Participation vs Non-Participation | t = .47 |
| Interaction 1 | t = -2.15 |
| Interaction 2 | t = 1.88 |

## FULL SCALE IQ (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 3.14 | 14.70 | 6.96 | | | | 8.75 |
| Non participating Parents | 5.00 | 7.11 | 9.21 | -2.65 | 10.65 | 17.95 | 7.59 |
| Program Means | 4.07 | 10.90 | 8.08 | -2.65 | 10.65 | 17.95 | 8.17 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -6.41 |
| 1,2,3 vs 5,6 | t = -3.97 |
| 5 vs 6 | t = -3.12 |
| 1 vs 2,3 | t = -2.66 |
| 2 vs 3 | t = .99 |
| Participation vs Non-Participation | t = .52 |
| Interaction 1 | t = -2.20 |
| Interaction 2 | t = 1.82 |

## INFORMATION RAW SCORE (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 4.92 | 3.58 | 4.24 | | | | 4.16 |
| Non-Participating Parents | 4.67 | 5.01 | 4.24 | 1.71 | 4.28 | 6.82 | 4.55 |
| Program Means | 4.79 | 4.29 | 4.24 | 1.71 | 4.28 | 6.82 | 4.36 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -5.11 |
| 1,2,3, vs 5,6 | t = -2.20 |
| 5 vs 6 | t = -3.44 |
| 1 vs 2,3 | t = .86 |
| 2 vs 3 | t = .06 |
| Participation vs Non-Participation | t = -.58 |
| Interaction 1 | t = .47 |
| Interaction 2 | t = -1.68 |

## INFORMATION SCALED SCORE (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 2.73 | 1.72 | 2.01 | | | | 2.45 |
| Non-Participating Parents | 2.71 | 2.31 | 2.01 | -0.09 | 2.64 | 5.97 | 2.64 |
| Program Means | 2.72 | 2.01 | 2.01 | -0.09 | 2.64 | 5.97 | 2.54 |

4 vs 1,2,3,5,6 t = -5.63

1,2,3, vs 5,6 t = -4.54

5 vs 6 t = -5.02

1 vs 2,3 t = 1.27

2 vs 3 t = 0.00

Participation vs Non-Participation t = -.31

Interaction 1 t = -.29

Interaction 2 t = -1.20

## VOCABULARY RAW SCORE (WPPSI)

2-9

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 3.37 | 5.14 | 2.75 | | | | 3.07 |
| Non-Participating Parents | 3.82 | 4.01 | 4.43 | 1.15 | 4.82 | 1.69 | 3.40 |
| Program Means | 3.59 | 4.57 | 3.59 | 1.15 | 4.82 | 1.69 | 3.24 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -3.43 |
| 1,2,3, vs 5,6 | t = 1.13 |
| 5 vs 6 | t = 3.74 |
| 1 vs 2,3 | t = -.68 |
| 2 vs 3 | t = .96 |
| Participation vs Non-Participation | t = -.41 |
| Interaction 1 | t = -2.41 |
| Interaction 2 | t = .15 |

## VOCABULARY SCALED SCORE (WPPSI)

2-10

| | $EP_2$ | $LP_1$ | $EP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 0.90 | 1.09 | -0.16 | | | | 0.49 |
| Non-Participating Parents | 0.65 | 0.63 | 1.87 | -0.35 | 1.38 | 0.73 | 0.93 |
| Program Means | 0.78 | 0.86 | 0.85 | -0.35 | 1.38 | 0.73 | 0.71 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -3.01 |
| 1,2,3 vs 5,6 | t = -.62 |
| 5 vs 6 | t = 1.33 |
| 1 vs 2,3 | t = -.19 |
| 2 vs 3 | t = .02 |
| Participation vs Non-Participation | t = -.94 |
| Interaction 1 | t = -3.48 |
| Interaction 2 | t = -.83 |

## ARITHMETIC RAW SCORE (WPPSI)

|  | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 2.43 | 2.05 | 2.19 |  |  |  | 1.94 |
| Non-Participating Parents | 3.08 | 0.41 | 2.03 | 0.12 | 3.28 | 0.98 | 1.55 |
| Program Means | 2.75 | 1.23 | 2.11 | 0.12 | 3.28 | 0.98 | 1.74 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -3.31 |
| 1,2,3 vs 5,6 | t = -.19 |
| 5 vs 6 | t = 3.34 |
| 1 vs 2,3 | t = 1.83 |
| 2 vs 3 | t = -1.06 |
| Participation vs Non-Participation | t = .59 |
| Interaction 1 | t = -3.21 |
| Interaction 2 | t = -.51 |

## ARITHMETIC SCALED SCORE (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 1.06 | 0.29 | -2.45 | | | | -0.11 |
| Non-Participating Parents | 1.09 | -1.06 | 0.60 | -1.70 | 1.88 | 1.12 | 0.47 |
| Program Means | 1.07 | -0.39 | -0.92 | -1.70 | 1.88 | 1.12 | 0.18 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -4.33 |
| 1,2,3 vs 5,6 | t = -3.72 |
| 5 vs 6 | t = 1.26 |
| 1 vs 2,3 | t = 3.33 |
| 2 vs 3. | t = .73 |
| Participation vs Non-Participation | t = -1.00 |
| Interaction 1 | t = -3.86 |
| Interaction 2 | t = .74 |

SIMILARITIES RAW SCORE (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 4.19 | 5.33 | 6.74 | | | | 5.42 |
| Non-Participating Parents | 3.94 | 3.62 | 3.82 | 2.24 | 4.92 | 6.64 | 3.79 |
| Program Means | 4.06 | 4.48 | 5.28 | 2.24 | 4.92 | 6.64 | 4.60 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -4.03 |
| 1,2,3, vs 5,6 | t = -2.03 |
| 5 vs 6 | t = -2.08 |
| 1 vs 2,3 | t = -1.16 |
| 2 vs 3 | t = -.78 |
| Participation vs Non-Participation | t = 2.01 |
| Interaction 1 | t = -.75 |
| Interaction 2 | t = -.59 |

## SIMILARITIES SCALED SCORE (WPPSI)

2-14

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 2.52 | 2.43 | 1.06 | | | | 2.20 |
| Non-Participating Parents | 2.08 | 1.17 | 1.91 | 0.22 | 2.65 | 3.88 | 1.92 |
| Program Means | 2.30 | 1.80 | 1.48 | 0.22 | 2.65 | 3.88 | 2.06 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -4.64 |
| 1,2,3 vs 5,6 | t = -3.21 |
| 5 vs 6 | t = -2.21 |
| 1 vs 2,3 | t = 1.32 |
| 2 vs 3 | t = .48 |
| Participation vs Non-Participation | t = .54 |
| Interaction 1 | t = -3.07 |
| Interaction 2 | t = -.49 |

## COMPREHENSION RAW SCORE (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 3.30 | 6.99 | 6.29 | | | | 5.37 |
| Non-Participating Parents | 2.39 | 2.58 | 3.96 | 2.57 | 4.37 | 4.87 | 2.82 |
| Program Means | 2.85 | 4.78 | 5.12 | 2.57 | 4.37 | 4.87 | 4.10 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -2.47 |
| 1,2,3 vs 5,6 | t = -.62 |
| 5 vs 6 | t = -.56 |
| 1 vs 2,3 | t = -2.87 |
| 2 vs 3 | t = -.33 |
| Participation vs Non-Participation | t = 3.15 |
| Interaction 1 | t = -2.50 |
| Interaction 2 | t = .69 |

## COMPREHENSION SCALED SCORE (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 0.69 | 2.47 | 1.71 | | | | 1.98 |
| Non-Participating Parents | 0.17 | -0.43 | 0.97 | 0.25 | 1.67 | 2.86 | 0.48 |
| Program Means | 0.26 | 1.02 | 1.34 | 0.25 | 1.67 | 2.86 | 1.23 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -2.77 |
| 1,2,3 vs 5,6 | t = -3.88 |
| 5 vs 6 | t = -2.40 |
| 1 vs 2,3 | t = -2.13 |
| 2 vs 3 | t = .52 |
| Participation vs Non-Participation | t = 3.19 |
| Interaction 1 | t = -3.90 |
| Interaction 2 | t = .18 |

## ANIMAL HOUSE RAW SCORE (WPPSI)

2-17

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 3.66 | 17.99 | 9.78 | | | | 7.14 |
| Non-Participating Parents | 4.82 | 14.62 | 16.20 | 1.28 | 6.56 | 5.69 | 8.55 |
| Program Means | 4.24 | 16.30 | 12.99 | 1.28 | 6.56 | 5.69 | 7.84 |

4 vs 1,2,3,5,6 t = -2.90

1,2,3 vs 5,6 t = 2.27

5 vs 6 t = .28

1 vs 2,3 t = -3.84

2 vs 3 t = .87

Participation vs Non-Participation t = - .47

Interaction 1 t = -1.26

Interaction 2 t = .96

ANIMAL HOUSE SCALED SCORE (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | -0.65 | 1.72 | 0.05 | | | | 0.25 |
| Non-Participating Parents | -0.71 | 0.94 | 0.89 | -1.24 | 0.42 | 1.20 | 0.25 |
| Program Means | -0.68 | 1.33 | 0.47 | -1.24 | 0.42 | 1.20 | 0.25 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -3.40 |
| 1,2,3 vs 5,6 | t = -.95 |
| 5 vs 6 | t = -1.23 |
| 1 vs 2,3 | t = -2.96 |
| 2 vs 3 | t = 1.17 |
| Participation vs Non-Participation | t = .01 |
| Interaction 1 | t = -2.14 |
| Interaction 2 | t = -.32 |

## ANIMAL HOUSE: ERRORS AND OMISSIONS (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | -1.97 | -4.75 | -5.32 | | | | -3.06 |
| Non-Participating Parents | -1.44 | -5.16 | -4.73 | -0.80 | -3.10 | -2.09 | -2.83 |
| Program Means | -1.70 | -4.95 | -5.03 | -0.80 | -3.10 | -2.09 | -2.95 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = 3.06 |
| 1,2,3 vs 5,6 | t = -1.91 |
| 5 vs 6 | t = -1.04 |
| 1 vs 2,3 | t = 3.95 |
| 2 vs 3 | t = .06 |
| Participation vs Non-Participation | t = -.26 |
| Interaction 1 | t = -1.60 |
| Interaction 2 | t = -.61 |

## PICTURE COMPLETION RAW SCORE (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 2.58 | 5.64 | 4.14 | | | | 3.80 |
| Non-Participating Parents | 3.15 | 4.42 | 5.43 | 0.69 | 5.53 | 4.53 | 4.01 |
| Program Means | 2.87 | 5.03 | 4.78 | 0.69 | 5.53 | 4.53 | 3.90 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -4.54 |
| 1,2,3 vs 5,6 | t = -1.17 |
| 5 vs 6 | t = 1.05 |
| 1 vs 2,3 | t = -2.49 |
| 2 vs 3 | t = .21 |
| Participation vs Non-Participation | t = -.23 |
| Interaction 1 | t = -1.74 |
| Interaction 2 | t = .42 |

## PICTURE COMPLETION SCALED SCORE (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 0.78 | 3.04 | 1.44 | | | | 1.83 |
| Non-Participating Parents | 0.10 | 1.77 | 2.48 | -0.53 | 3.01 | 3.23 | 1.83 |
| Program Means | 0.89 | 2.41 | 1.96 | -0.53 | 3.01 | 3.23 | 1.83 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -5.03 |
| 1,2,3 vs 5,6 | t = -3.06 |
| 5 vs 6 | t = -.35 |
| 1 vs 2,3 | t = -2.34 |
| 2 vs 3 | t = .57 |
| Participation vs Non-Participation | t = .00 |
| Interaction 1 | t = -2.64 |
| Interaction 2 | t = .14 |

## MAZES RAW SCORE (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 2.35 | 6.76 | 1.53 | | | | 3.97 |
| Non-Participating Parents | 2.95 | 2.66 | 1.57 | 3.64 | 4.43 | 3.42 | 2.82 |
| Program Means | 2.65 | 4.71 | 1.55 | 3.64 | 4.43 | 3.42 | 3.40 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = .29 |
| 1,2,3 vs 5,6 | t = -1.21 |
| 5 vs 6 | t = .91 |
| 1 vs 2,3 | t = -.50 |
| 2 vs 3 | t = 2.37 |
| Participation vs Non-Participation | t = -1.10 |
| Interaction 1 | t = 2.17 |
| INteraction 2 | t = 1.74 |

## MAZES SCALED SCORE (WPPSI)

2-24

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 0.35 | 2.75 | -0.15 | | | | 1.43 |
| Non-Participating Parents | 0.30 | 0.11 | 0.48 | 0.99 | 1.73 | 1.85 | 0.74 |
| Program Means | 0.32 | 1.43 | 0.16 | 0.99 | 1.73 | 1.85 | 1.03 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -.18 |
| 1,2,3 vs 5,6 | t = -2.32 |
| 5 vs 6 | t = -.17 |
| 1 vs 2,3 | t = .79 |
| 2 vs 3 | t = 1.49 |
| Participation vs Non-Participation | t = 1.03 |
| Interaction 1 | t = -2.78 |
| Interaction 2 | t = 1.26 |

## GEOMETRIC DESIGN RAW SCORE (WPPSI) 2-25

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | -0.46 | 7.47 | 5.85 | | | | 2.62 |
| Non-Participating Parents | 0.52 | 3.99 | 6.74 | 0.81 | 0.20 | 1.03 | 2.08 |
| Program Means | 0.03 | 5.73 | 6.29 | 0.81 | 0.20 | 1.03 | 2.35 |

4 vs 1,2,3,5,6 t = -1.42

1,2,3 vs 5,6 t = 3.14

5 vs 6 t = -.55

1 vs 2,3 t = -4.53

2 vs 3 t = -.30

Participation vs Non-Participation t = .38

Interaction 1 t = -2.12

Interaction 2 t = .78

## GEOMETRIC DESIGN SCALED SCORE (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | -1.20 | 3.82 | 0.60 | | | | 1.01 |
| Non-Participating Parents | -0.50 | 1.41 | 0.46 | -0.19 | 0.08 | 2.10 | 0.40 |
| Program Means | -0.85 | 2.62 | 0.53 | -0.19 | 0.08 | 2.10 | 0.71 |

4 vs 1,2,3,5,6 t = -1.95

1,2,3 vs 5,6 t = -0.68

5 vs 6 t = -3.12

1 vs 2,3 t = -4.42

2 vs 3 t = 2.71

Participation vs Non-Participation t = 1.02

Interaction 1 t = 3.27

Interaction 2 t = .83

## BLOCK DESIGN RAW SCORE (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 1.37 | 4.31 | 5.44 | | | | 3.34 |
| Non-Participating Parents | 1.70 | 2.58 | 4.69 | 1.91 | 4.28 | 1.66 | 2.62 |
| Program Means | 1.54 | 3.45 | 5.07 | 1.91 | 4.28 | 1.66 | 2.98 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -1.32 |
| 1,2,3 vs 5,6 | t = .48 |
| 5 vs 6 | t = 2.29 |
| 1 vs 2,3 | t = -2.81 |
| 2 vs 3 | t = -1.19 |
| Participation vs Non-Participation | t = .67 |
| Interaction 1 | t = -1.31 |
| Interaction 2 | t = .01 |

## BLOCK DESIGN SCALED SCORE (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 0.21 | 2.26 | 0.98 | | | | 1.61 |
| Non-Participating Parents | -0.19 | -0.35 | 0.86 | 0.32 | 2.40 | 1.94 | 0.57 |
| Program Means | 0.01 | 0.96 | 0.92 | 0.32 | 2.40 | 1.94 | 1.09 |

4 vs 1,2,3,5,6 t = -1.68

1,2,3 vs 5,6 t = -3.45

5 vs 6 t = .73

1 vs 2,3 t = 1.68

2 vs 3 t = .04

Participation vs Non-Participation t = 1.73

Interaction 1 t = 3.23

Interaction 2 t = .36

RAW SCORES: TOTAL (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 3.97 | 12.55 | 15.06 | | | | 9.68 |
| Non-Participating Parents | 7.63 | 11.70 | 12.55 | 9.25 | 11.24 | 6.16 | 9.78 |
| Program Means | 5.80 | 12.13 | 13.81 | 9.25 | 11.24 | 6.16 | 9.73 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = .38 |
| 1,2,3 vs 5,6 | t = 1.52 |
| 5 vs 6 | t = 2.78 |
| 1 vs 2,3 | t = 4.75 |
| 2 vs 3 | t = .78 |
| Participation vs Non-Participation | t = .06 |
| Interaction 1 | t = .66 |
| Interaction 2 | t = .12 |

## RAW SCORES: PRO-RATED (WPPSI)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 25.26 | 61.75 | 76.12 | | | | 49.17 |
| Non-Participating Parents | 47.00 | 59.51 | 64.04 | 47.28 | 53.09 | 35.25 | 51.64 |
| Program Means | 36.13 | 60.63 | 70.08 | 47.28 | 53.09 | 35.25 | 50.41 |

4 vs 1,2,3,5,6 t = -.51

1,2,3 vs 5,6 t = 1.92

5 vs 6 t = 2.01

1 vs 2,3 t = -4.01

2 vs 3 t = .91

Participation vs Non-Participation t = .30

Interaction 1 t = .46

Interaction 2 t = .36

## PSYCHOLINGUISTIC AGE* (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | -6.08 | 13.39 | 20.25 | | | | 4.85 |
| Non-Participating Parents | 31.39 | 15.24 | 17.81 | 6.22 | 7.83 | 5.93 | 17.15 |
| Program Mean | 12.66 | 14.32 | 19.03 | 6.22 | 7.83 | 5.93 | 11.00 |

* Pro-rated sum of raw scores

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = .71 |
| 1,2,3 vs 5,6 | t = 1.23 |
| 5 vs 6 | t = .19 |
| 1 vs 2,3 | t = .50 |
| 2 vs 3 | t = .41 |
| Participation vs Non-Participation | t = 1.37 |
| Interaction 1 | t = .79 |
| Interaction 2 | t = .83 |

## AUDITORY ASSOCIATION RAW SCORE (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 2.58 | 4.46 | 7.85 | | | | 4.01 |
| Non-Participating Parents | 4.78 | 5.86 | 8.24 | 3.58 | 5.78 | 1.80 | 5.34 |
| Program Means | 3.68 | 5.16 | 8.04 | 3.58 | 5.78 | 1.80 | 4.67 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -1.72 |
| 1,2,3 vs 5,6 | t = 2.95 |
| 5 vs 6 | t = 4.49 |
| 1 vs 2,3 | t = -3.85 |
| 2 vs 3 | t = -2.60 |
| Participation vs Non-Participation | t = -1.58 |
| Interaction 1 | t = .32 |
| Interaction 2 | t = .51 |

LANGUAGE AGE SCORE* (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | -12.44 | 1.65 | 19.33 | | | | -3.81 |
| Non-Participating Parents | 36.11 | 9.55 | 23.84 | -0.43 | 2.39 | -2.88 | 16.51 |
| Program Means | 11.81 | 5.60 | 21.58 | -0.43 | 2.39 | -2.88 | 6.35 |

* Subscore of Auditory Association

4 vs 1,2,3,5,6 t = .71

1,2,3 vs 5,6 t = 1.41

5 vs 6 t = .39

1 vs 2,3 t = .15

2 vs 3 t = .19

Participation vs Non-Participation t = .59

Interaction 1 t = .59

Interaction 2 t = .77

## AUDITORY ASSOCIATION SCALED SCORE (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | -0.06 | 1.16 | 5.24 | | | | 1.66 |
| Non Participating Parents | 2.30 | 3.41 | 6.07 | 1.45 | 4.62 | 0.59 | 3.48 |
| Program Means | 1.12 | 2.28 | 5.65 | 1.45 | 4.62 | 0.59 | 2.57 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = -1.22 |
| 1,2,3 vs 5,6 | t = .33 |
| 5 vs 6 | t = 2.42 |
| 1 vs 2,3 | t = -2.00 |
| 2 vs 3 | t = -1.66 |
| Participation vs Non-Participation | t = -1.16 |
| Interaction 1 | t = .19 |
| Interaction 2 | t = .58 |

## VERBAL EXPRESSION RAW SCORE (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 2.57 | 8.25 | 6.61 | | | | 5.70 |
| Non-Participating Parents | 4.40 | 5.69 | 4.35 | 5.74 | 5.73 | 3.85 | 4.71 |
| Program Mean | 3.48 | 6.97 | 5.48 | 5.74 | 5.73 | 3.85 | 5.21 |

z

4 vs 1,2,3,5,6 t = .59

1,2,3 vs 5,6 t = .59

5 vs 6 t = 1.41

1 vs 2,3 t = -2.53

2 vs 3 t = .98

Participation vs Non-Participation t = .84

Interaction 1 t = -1.42

Interaction 2 t = .38

## LANGUAGE AGE SCORE* (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | -8.44 | 19.72 | 15.34 | | | | 5.61 |
| Non Participating Parents | 23.69 | 13.07 | 9.24 | 7.75 | 10.63 | 1.06 | 13.77 |
| Program | 10.12 | 16.39 | 12.29 | 7.75 | 10.63 | 1.06 | 9.71 |

*Subscore of Verbal Expression

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = .28 |
| 1,2,3 vs 5,6 | t = 1.02 |
| 5 vs 6 | t = .90 |
| 1 vs 2,3 | t = .49 |
| 2 vs 3 | t = .34 |
| Participation vs Non-Participation | t = .86 |
| Interaction 1 | t = 1.20 |
| Interaction 2 | t = .98 |

## VERBAL EXPRESSION SCALED SCORE (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 1.73 | 4.77 | 3.61 | | | | 4.20 |
| Non Participating Parents | 0.95 | 2.48 | 1.69 | 4.60 | 3.99 | 4.00 | 2.54 |
| Program Means | 1.34 | 3.62 | 2.65 | 4.60 | 3.99 | 4.00 | 3.37 |

4 vs 1,2,3,5,6 t = 1.18

1,2,3 vs 5,6 t = -1.40

5 vs 6 t = 0.01

1 vs 2,3 t = 1.45

2 vs 3 t = .56

Participation vs Non-Participation t = 1.21

Interaction 1 t = .81

Interaction 2 t = .18

## LABELS (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 0.22 | -0.02 | -0.58 | | | | -0.24 |
| Non-Participating Parents | 0.26 | 0.24 | 0.09 | -0.47 | -0.07 | 0.00 | 0.09 |
| Program Means | 0.24 | 0.11 | -0.24 | -0.47 | 0.07 | 0.00 | -0.07 |

4 vs 1,2,3,5,6 t = 2.03

1,2,3 vs 5,6 t = .35

5 vs 6 t = .26

1 vs 2,3 t = 1.30

2 vs 3 t = 1.07

Participation vs Non-Participation t = 1.24

Interaction 1 t = 4.79

Interaction 2 t = 4.25

COLOR (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | -0.04 | 0.76 | 0.18 | | | | 0.49 |
| Non-Participating Parents | 0.35 | 0.66 | -0.32 | 0.45 | 1.01 | 0.46 | 0.42 |
| Program Means | 0.15 | 0.71 | -0.07 | 0.45 | 1.01 | 0.46 | 0.45 |

4 vs 1,2,3,5,6 t = .02

1,2,3 vs 5,6 t = -2.01

5 vs 6 t = 1.65

1 vs 2,3 t = -.60

2 vs 3 t = 1.96

Participation vs Non-Participation t = .23

Interaction 1 t = .40

Interaction 2 t = 3.94

## SHAPE (ITPA)

|  | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | -0.17 | 0.59 | 0.19 |  |  |  | 0.06 |
| Non-Participating Parents | 0.29 | 1.17 | 0.70 | 0.71 | 0.09 | -0.28 | 0.58 |
| Program Means | 0.06 | 0.38 | 0.44 | 0.71 | 0.09 | -0.28 | 0.32 |

4 vs 1,2,3,5,6 t = 2.00

1,2,3 vs 5,6 t = 2.98

5 vs 6 t = 1.39

1 vs 2,3 t = -2.64

2 vs 3 t = 1.36

Participation vs Non-Participation t = -2.07

Interaction 1 t = 2.80

Interaction 2 t = 3.21

## COMPOSITION (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | -0.10 | -0.21 | -0.22 | | | | -0.33 |
| Non-Participating Parents | 0.10 | 0.48 | 0.25 | -0.35 | -0.11 | -0.31 | 0.12 |
| Program Means | -0.00 | 0.13 | 0.12 | -0.35 | -0.11 | -0.31 | -0.10 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = 1.81 |
| 1,2,3 vs 5,6 | t = 1.93 |
| 5 vs 6 | t = 1.08 |
| 1 vs 2,3 | t = -.48 |
| 2 vs 3 | t = .51 |
| Participation vs Non-Participation | t = -2.50 |
| Interaction 1 | t = 3.90 |
| Interaction 2 | t = 5.71 |

## FUNCTIONS (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 1.03 | 3.09 | 4.07 | | | | 2.67 |
| Non-Participating Parents | 1.48 | 2.68 | 1.28 | 2.38 | 2.63 | 1.53 | 1.77 |
| Program Means | 1.25 | 2.89 | 2.67 | 2.38 | 2.63 | 1.53 | 2.23 |

4 vs 1,2,3,5,6 t = .28

1,2,3 vs 5,6 t = .35

5 vs 6 t = 1.34

1 vs 2,3 t = 2.24

2 vs 3 t = 2.23

Participation vs Non-Participation t = 1.23

Interaction 1 t = .65

Interaction 2 t = 1.62

## MAJOR PARTS (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | -0.51 | 0.19 | -0.18 | | | | -0.08 |
| Non-Participating Parents | 0.19 | 0.19 | 0.07 | 0.49 | -0.41 | -0.27 | -0.05 |
| Program Means | -0.16 | 0.01 | -0.05 | 0.49 | -0.41 | -0.27 | -0.06 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = 2.73 |
| 1,2,3 vs 5,6 | t = 1.32 |
| 5 vs 6 | t = -.47 |
| 1 vs 2,3 | t = -.55 |
| 2 vs 3 | t = .17 |
| Participation vs Non-Participation | t = -1.00 |
| Interaction 1 | t = -6.16 |
| Interaction 2 | t = 3.97 |

## NUMEROSITY (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | -0.10 | 0.58 | 0.30 | | | | 0.23 |
| Non-Participating Parents | 0.19 | 0.07 | 0.14 | 0.28 | 0.11 | 0.05 | 0.10 |
| Program Means | 0.04 | 0.32 | 0.22 | 0.28 | 0.11 | 0.05 | 0.16 |

4 vs 1,2,3,5,6 t = .72

1,2,3 vs 5,6 t = .00

5 vs 6 t = .38

1 vs 2,3 t = 1.85

2 vs 3 t = .60

Participation vs Non-Participation t = .89

Interaction 1 t = 10.80

Interaction 2 t = 6.89

## COMPARISON (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | -0.04 | -0.01 | -0.07 | | | | -0.13 |
| Non-Participating Parents | -0.08 | 0.39 | 0.02 | -0.02 | -0.27 | -0.16 | 0.02 |
| Program Means | -0.06 | 0.19 | -0.03 | -0.02 | -0.27 | -0.16 | -0.06 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = .37 |
| 1,2,3 vs 5,6 | t = 2.34 |
| 5 vs 6 | t = .76 |
| 1 vs 2,3 | t = 1.12 |
| 2 vs 3 | t = 1.20 |
| Participation vs Non Participation | t = 1.04 |
| Interaction 1 | t = .17 |
| Interaction 2 | t = 2.33 |

# OTHER CHARACTERISTICS (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 0.03 | 0.30 | -0.19 | | | | -0.02 |
| Non-Participating Parents | 0.47 | -0.05 | 0.02 | -0.09 | -0.00 | 0.01 | 0.10 |
| Program Means | 0.25 | 0.12 | -0.05 | -0.09 | -0.00 | .01 | 0.04 |

4 vs 1,2,3,5,6 t = 1.45

1,2,3 vs 5,6 t = .94

5 vs 6 t = .05

1 vs 2,3 t = 1.57

2 vs 3 t = .90

Participation vs Non-Participation t = .83

Interaction 1 t = 7.39

Interaction 2 t = 4.09

## PERSON, PLACE OR THING (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 0.81 | 1.09 | 1.69 | | | | 1.51 |
| Non-Participating Parents | 0.75 | 0.74 | 0.45 | 1.72 | 2.23 | 0.71 | 0.96 |
| Program Means | 0.78 | 0.91 | 1.07 | 1.72 | 2.23 | 0.71 | 1.24 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = 1.28 |
| 1,2,3 vs 5,6 | t = 1.53 |
| 5 vs 6 | t = 2.93 |
| 1 vs 2,3 | t = .49 |
| 2 vs 3 | t = .26 |
| Participation vs Non-Participation | t = 1.23 |
| Interaction 1 | t = 1.22 |
| Interaction 2 | t = 1.83 |

## NUMBER OF DIFFERENT CATEGORIES OF CREDITED RESPONSES (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 0.58 | 1.17 | 0.42 | | | | 0.56 |
| Non-Participating Parents | 1.49 | 1.94 | 1.15 | 1.22 | 0.90 | 0.27 | 1.36 |
| Program Means | 1.04 | 1.55 | 0.79 | 1.22 | 0.90 | 0.27 | 0.96 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = .82 |
| 1,2,3 vs 5,6 | t = 1.74 |
| 5 vs 6 | t = 1.38 |
| 1 vs 2,3 | t = .35 |
| 2 vs 3 | t = 1.44 |
| Participation vs Non-Participation | t = 1.92 |
| Interaction 1 | t = 2.45 |
| Interaction 2 | t = 2.36 |

## CHRONOLOGICAL AGE AT TIME OF TESTING (ITPA)

| | $EP_2$ | $LP_1$ | $LP_2$ | C | E | L | MEAN |
|---|---|---|---|---|---|---|---|
| Participating Parents | 5.59 | 6.35 | 5.66 | | | | 5.76 |
| Non-Participating Parents | 6.08 | 6.79 | 6.44 | 6.05 | 5.23 | 6.53 | 6.33 |
| Program Means | 5.83 | 6.57 | 6.05 | 6.05 | 5.23 | 6.53 | 6.04 |

| | |
|---|---|
| 4 vs 1,2,3,5,6 | t = .01 |
| 1,2,3 vs 5,6 | t = .41 |
| 5 vs 6 | t = 1.43 |
| 1 vs 2,3 | t = .69 |
| 2 vs 3 | t = .55 |
| Participation vs Non-Participation | t = .76 |
| Interaction 1 | t = .35 |
| Interaction 2 | t = .11 |

# APPENDIX III

# INSTRUMENTAL PERFORMANCE AS A FUNCTION OF REINFORCEMENT SCHEDULE, LUCK VERSUS SKILL INSTRUCTIONS, AND SEX OF CHILD

John R. Stabler and Edward E. Johnson
Georgia State University and Southern University

Theory and research concerning internal versus external locus of control of reward has been elaborated recently within the context of social learning theory (Rotter, 1966). Experimental studies have demonstrated that adults who were given instructions that reward depended upon their skill rather than upon luck showed more resistance to extinction after 100% reinforcement than after 50% reinforcement. Under luck instructions the usual partial reinforcement (PRE) was obtained (James & Rotter, 1958). The results were replicated by Holden and Rotter (1962) with slightly different extinction measures, and by Rotter, Liverant, and Crowne (1961), using different tasks to induce a skill or a chance orientation. The present experiment extends such research from adults to children.

In a recent review on frustrative nonreward applied to children's behavior, Ryan and Watson (1968) noted, "Additional research is needed to compare the effects of nonreward under conditions which may be construed as self or other-blame situations." They also stated, "It is hoped that over the next few years the relationship of personality variables to reaction to nonreward will be given more than the cursory attention it has received to date."

## METHOD

### Subjects and Experimental Design

The Ss were 32 male ($\bar{X}$ CA = 5 yr. 1 mo., SD = 3.9 mo.) and 32 female children ($\bar{X}$ CA = 5 yr. 3 mo., SD = 4.3 mo.) obtained from one local Head

Start Center. The 64 children were assigned in equal numbers to eight treatment conditions. Schedule of reinforcement (50% vs. 100%), instructions (luck vs. skill), sex (male vs. female), and trial block (10 trials per block) were combined in a mixed factorial design.

### Apparatus

The instrumental response was to press five telegraph keys consecutively on a stimulus display panel. An arrow to the left of the telegraph keys could be lighted to signal S to begin the response, and a light above each key signaled S which key to press. A reinforcement dispenser sounded a melody of bells and dispensed a marble into a glass jar at the termination of a rewarded response. Three standard electric timers measured the child's time on three segments of the response: from onset of the arrow light to pressing of the first key; from the first key to the fourth key; and from the fourth to the fifth key. As one timer was terminated, the next began, thus providing measures of starting, movement, and finishing times.

### Procedure

Each child was taken individually to the experimental room where he was shown the apparatus and was asked to select from a tray of six toys the one he liked the most. The S was instructed to place his hand on a tape X located beneath the arrow light and to press the buttons when the light went on. The E demonstrated one rewarded trial in a similar manner to each S, administered one pretraining rewarded trial, and then administered 40 acquisition trials and 20 extinction trials. If S delayed over 30 sec on any segment of the response, E would say "Win (or, Get) as many marbles as you can," recorded the response as 30 sec, and began a new trial. Marbles were dispensed on the 50% schedule of reinforcement such that rewarded trials were followed by nonrewarded trials as often as nonrewarded trials were followed by rewarded trials, runs of rewarded trials occurred as often as runs of nonrewarded trials (no runs exceeded three), and the last acquisition trial was a rewarded trial. The same reward schedule operated within two blocks of 20 trials each for the partial reinforcement groups.

The instructions were as follows:

### Luck Instructions

"This is a game you can get prizes for. Do you like prizes? Good. Pick the prize you want most of all. I'll put it here. You have to get it by playing the game. Not every child gets the prize. You get the prize if you get enough marbles. You have to be lucky to get the marbles. Do you know what I mean by lucky? The machine will give you a marble when you are lucky. It's all a matter of luck. I'll show you how to play. Look. I'm lucky this time. I got a marble. Now you do it. You got a marble. Get as many marbles as you can so that you can keep the prize. You will get marbles if you're lucky." On 10 predetermined trials E said either, "You're lucky," or, "You were lucky that time."

### Skill Instructions

"This is a game you can win prizes for. Do you like prizes? Good. Pick that prize you want most of all. I'll put it here. You have to win it by playing the game. Not every child wins the prize. You can win the prize if you win enough marbles. You have to do it right to win the marbles. It's not easy to do it right. You can make the machine give you a marble dy doing it right. I'll show you how to do it right. Look. I did it right this time. I won a marble. Now you do it. You did it right this time. You won a marble. Win as many marbles as you can so that you can keep the prize. You will win marbles if you do it right." On 10 predetermined trials E said either, "You did it right," or, "You really know how to do it."

## RESULTS AND DISCUSSION

All data for starting, movement, and finishing times were converted to speed scores (5 sec/T for starting, 9 sec/T for movement, and 3 sec/T for finishing). Mean group speeds were computed for six blocks of 10 trials: four blocks for acquisition and two blocks for extinction. The speed scores for acquisition and extinction were analyzed by analysis of variance. Starting, movement, and finishing speeds were each analyzed separately.

### Acquisition

The only significant effect for acquisition starting speeds was for trial blocks ($F = 15.94$, $df = 3,168$, $p < .01$) which indicated increasing speeds with practice. Acquisition finishing speeds showed a Reinforcement Schedule × Trial Block interaction ($F = 2.90$, $df = 3,168$, $p < .05$). The finding that speeds of the partial reinforcement (PR) groups became relatively greater than the continuous reinforcement (CR) groups as training progressed is consistent with past experiments with children on the partial reinforcement acquisition effect (PRAE) (Ryan & Watson, 1968).

The PRAE has been attributed to both motivational and associational factors. Motivationally, greater speeds of the PR groups may be due to nonreward-produced primary frustration preserving from trial to trial. Evidence that nonreward does lead to primary frustration comes from studies of the frustration effect (FE) with both infra-humans (e.g., Amsel, 1958) and humans (Ryan, 1965). A motivational-associational interpretation suggests that anticipatory frustration becomes conditioned (perhaps to the experimental situation as a whole) and thereby motivates the response. Pederson (1967), however, offers some evidence contrary to this interpretation. A third possible interpretation is that neither primary nor conditioned frustration plays a role in the acquisition findings obtained. Instead, PR groups may respond faster simply because of past learning experience. For example, in our culture children have been taught to try harder if they do not at first succeed.

Consistent with earlier acquisition studies (e.g., Bruning, 1964; Ryan, 1966), the CR groups showed a decline in performance across trial blocks. The nondeclining CR curve found by Pederson (1967) may not have been obtained here because of a satiation effect arising from the similarity of the rewards ("cat's eyes" marbles).

## Extinction

The analysis of starting speeds during extinction revealed three main effects; schedule of reinforcement ($F = 4.74$, $df = 1,56$, $p < .05$), instructions ($F = 4.04$, $df = 1,56$, $p < .05$), and sex ($F = 4.85$, $df = 1,56$, $p < .05$). There was more resistance to extinction after partial reinforcement than after continuous reinforcement, after skill instructions than after luck instructions, and for females than for males. Analyses of movement and finishing speeds during extinction showed a significant decline (F = 16.50, df = 1,56, $p < .01$, and F = 10.29, df = 1,56, $p < .01$, respectively). The analysis of movement speeds also showed two interaction effects: Reinforcement Schedule × Instructions (F = 4.50, df = 1,56, $p < .05$) and Reinforcement Schedule × Sex × Trial Block (F = 6.07, df = 1,56, $p < .05$).

The first interaction shows that children's performance in response to the reinforcement schedule by instruction combinations was similar to that of adult Ss. A PRE was obtained under luck instructions and an inverse PRE was obtained under skill instructions. Children given skill instructions and continuous reinforcement were the most resistant to extinction, and children given luck instructions and continuous reinforcement were the least resistant to extinction. Under skill instructions, according to Rotter (1966), the CR Ss would be more resistant to extinction because they believed their skill would eventually enable them to obtain more rewards. The PR Ss, on the other hand, may have believed they were not very skillful, since they had won a reward only half the time; and they therefore extinguished more quickly when rewards were stopped altogether. Such an effect could have been mediated by implicit verbal responses of the nature, "I never could do this right, so I might as well quit." After luck instructions and continuous reinforcement the extinction series may have been perceived as a change in the situation, a disappearance of previous luck; whereas after partial reinforcement the extinction series may not have been perceived as very different than the training series.

The second interaction reflects greater persistence of female Ss, on the CR schedule, on the last blocks of trials. They may have responded more as if they had been skill-instructed rather than luck-instructed, regardless of the actual instructions they received. That is, they responded as though they were more internally oriented than boys. This hypothesis is supported by developmental-personality research which has shown that girls are more self-responsible, i.e., more apt to see the contingency between act and effect than are boys. (Crandall, Katkovsky, & Crandall, 1965). Although the Crandall study found the personality difference to be measurable only with girls and boys in the 6th grade or higher, their measure was a paper and pencil test, and sex differences at earlier ages may be present but difficult to measure.

## TABLE I

## MEAN STARTING, MOVEMENT, AND FINISHING SPEEDS FOR EACH EXTINCTION BLOCK FOR THE EIGHT GROUPS[a]

| | Trial Block | | | | | |
|---|---|---|---|---|---|---|
| Group | Starting | | Movement | | Finishing | |
| | 1 | 2 | 1 | 2 | 1 | 2 |
| Partial rein., skill, male | 3.99 | 3.46 | 3.46 | 3.29 | 3.21 | 3.12 |
| Partial rein., skill, female | 4.18 | 3.51 | 3.60 | 3.05 | 3.68 | 3.12 |
| Partial rein., luck, male | 3.22 | 3.38 | 3.81 | 3.39 | 4.12 | 3.60 |
| Partial rein., luck, female | 4.52 | 3.74 | 3.61 | 3.28 | 3.60 | 3.05 |
| Continuous rein., skill, male | 3.48 | 3.38 | 3.89 | 3.58 | 3.85 | 3.50 |
| Continuous rein., skill, female | 3.69 | 4.15 | 3.51 | 3.92 | 3.98 | 3.86 |
| Continuous rein., luck, male | 2.42 | 2.12 | 3.38 | 2.85 | 3.36 | 3.10 |
| Continuous rein., luck, female | 3.10 | 3.14 | 3.40 | 3.16 | 3.61 | 3.52 |

[a] n = 8 in each group.

# REFERENCES

Amsel, A. The role of frustrative non-reward in noncontinuous reward situations. *Psychological Bulletin*, 1958, 55, 102-119.

Bruning, J. L. The effects of magnitude of reward and percentage of reinforcement on a lever movement response. *Child Development*, 1964, 35, 281-285.

Crandall, V. C., Katkovsky, W., & Crandall, V. Children's beliefs in their own control of reinforcement in intellectual-academic achievement situations. *Child Development*, 1965, 36, 91-109.

Holden, K. B., & Rotter, J. B. A nonverbal measure of extinction in skill and chance situations. *Journal of Experimental Psychology*, 1962, 63, 519-520.

James, W. H., & Rotter, J. B. Partial and 100% reinforcement under chance and skill conditions. *Journal of Experimental Psychology*, 1958, 55, 397-403.

Pederson, D. R. Associative versus motivational interpretations of reward percentage effects on children's performance. *Psychonomic Science*, 1967, 8, 139-140.

Rotter, J. B. Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs*, 1966, 80 (1. Whole No. 609).

Rotter, J. B., Liverant, S., & Crowne, D. P. The growth and extinction of expectancies in chance controlled and skilled tasks. *Journal of Psychology*, 1961, 52, 161-177.

Ryan, T. J. The effects of nonreinforcement and incentive value on response speed. *Child Development*, 1965, 36, 1067-1081.

Ryan, T. J. Instrumental performance as related to several reward schedules and age. *Journal of Experimental Child Psychology*, 1966, 3, 398-404.

Ryan, T. J., & Watson, P. Frustrative non-reward theory applied to children's behavior. *Psychological Bulletin*, 1968, 69, 111-125.